ANNUAL REPORT

2023-2024

ADVANCED TECHNICAL SKILLS SIMULATION LABORATORY

ATSSL
Advanced Technical Skills Simulation Laboratory

UNIVERSITY OF CALGARY

CONTENT

CONTENT

ABOUT US

- The Advanced Technical Skills Simulation Laboratory (ATSSL) is a state-of-art facility dedicated to advancing medical education and enhancing patient care through high-quality simulation training.
- Since its establishment in 2014, it has offered a comprehensive range of simulation modalities, including procedural skills using human and cadaveric tissue, as well as theater-based simulations, for all learners in pre-licensure and licensed health professional education at the University of Calgary (UCalgary) and Alberta Health Services (AHS).
- This encompasses medical students, postgraduate medical residents, practicing physicians, nursing students, nurses, and allied health professionals.
- The ATSSL Live Animal Surgical Laboratory, provides advanced surgical training for senior residents using porcine and ovine models, supported by Animal Health Technicians who ensure ethical, humane, and CCAC-compliant care, alongside rigorous scientific and pedagogical merit reviews for animal-based research and teaching.
- The ATSSL received accreditation as a Simulation Program from the Royal College of Physicians and Surgeons of Canada (RCPSC) in 2018 and will remain accredited with the RCPSC until 2028.
- The ATSSL is dedicated to advancing simulation-based medical education (SBME) and promoting patient safety and quality of care.
- To achieve this goal, the ATSSL collaborates with partners in the University of Calgary Cumming School of Medicine (CSM) and AHS to develop comprehensive curricula focused on skill development, interprofessional collaboration, patient safety and research.
- Emphasis is placed on the acquisition of skills and knowledge, interprofessional training and teamwork, and an enhanced understanding of patient safety risks.
- The operations of the ATSSL are an integral part of the CSM's mission to **"Create the Future of Health“,** to equip healthcare professionals with the competence and confidence needed for excellence in medical practice.

OUR LABORATORIES

“State-of-the-Art Facility”

TOTAL AREA

- over 30 000 square ft

LABORATORIES

- Clinical Skills Simulation Laboratory (CSL) – HSC G820
- Surgical Skills Simulation Laboratory (SSL) – HRIC BA01
- Special Procedures Laboratory (SPL) – HSC 875B
- ATSSL Body Donation Program (BDP) – HSC B723

OUR VISION AND MISSION

VISION

Global leader in innovative simulated education and assessment for health professionals to improve patient outcomes and research.

MISSION

The ATSSL is committed to providing innovative and interprofessional simulation-based medical education and research.

We continuously aim to produce effective, confident, and safe medical and surgical professionals while improving patient safety and quality of care.

OUR GOALS

FULL SPECTRUM

- Design and facilitate individual and team-based SBME for an inclusive community of diverse learners, offering a full complement of simulation modalities in a safe environment.

EVIDENCE-BASED APPROACH

- Effective design of appropriate quality simulation activities, incorporating a cost-effective, evidence-based approach.

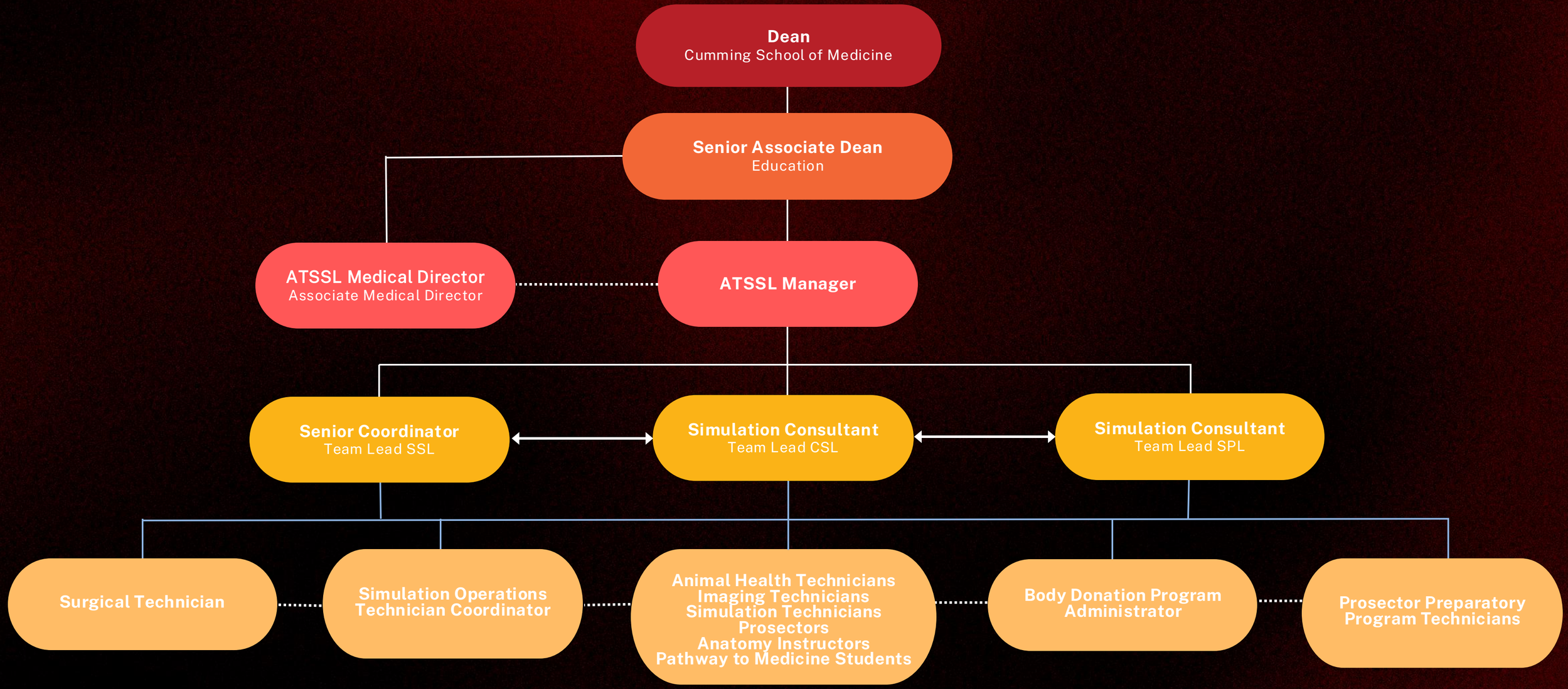
FULL ACCREDITATION

- Maintain a high visibility, excellent reputation validated through retention of full accreditation

RESEARCH AND SCHOLARSHIP

- Support research and scholarship in SBME and assessment activities.

GOVERNANCE AND ORGANIZATIONAL STRUCTURE



Direct Report (All ATSSL staff direct report to ATSSL Manager)
Denotes Relationship (Not a Direct Report)
Accountable to

- *SSL – Surgical Skills Simulation Laboratory*
- *CSL - Clinical Skills Simulation Laboratory*
- *SPL – Special Procedures Laboratory*

EDUCATION REVIEW SUB-COMMITTEE

The Education Review Sub-Committee, which reports to the CSM Executive Committee, is responsible for planning, strategizing, and implementing the educational aspects of the ATSSL. This committee convenes as per director’s request, and members are appointed by the organizations and departments they represent. Their specific duties include ensuring that simulation events align with the ATSSL's vision, mission, and goals, monitoring the quality of educational activities, identifying opportunities for scholarship, and contributing to accreditation standards and documentation.

Dr. Chandrew Rajakumar
ATSSL Medical Director/ Chair

MEMBERS

- **George Mulvey** — *ATSSL Operations Manager*
- **Heather Hill** — *ATSSL Coordinator*
- **Jan Rossiter** — *ATSSL Simulation Consultant*
- **Michèle Cowan** — *ATSSL Simulation Consultant*
- **Dr. Sarah McQuillan** — *Obstetrics & Gynecology*
- **Dr. Ghazwan Altabbaa** — *Internal Medicine*
- **Dr. Catherine Patocka** — *Emergency Medicine*
- **Dr. Steve Lopushinsky** — *Surgery*
- **Dr. Vincent Grant** — *Pediatrics & Emergency Medicine*
- **Dr. Sarah Weeks** — *Cardiac Sciences*

AD HOC MEMBERSHIP

eSIM Provincial Simulation Program · OHMES · W21C · Research Faculty · Simulation Fellows · Directors from other Programs

OUR ROLES

	Roles	Responsibilities
Dr. C. Rajakumar	Medical Director/Chair (*Leadership*)	• Provides some strategic medical leadership for ATSSL, focusing on key areas such as compliance with accreditation and medicolegal requirements, offering input on strategic plans, supporting research efforts, and contributing to collaborations where needed.
G. Mulvey	Operations Manager (*Leadership*)	• Manages all aspects of ATSSL, including human resources and recruitment, facility management, operational planning, budgeting and financial oversight, compliance with health and safety, biosafety, medicolegal standards, and RCPSC simulation accreditation. • Monitors, summarizes, and communicates operations of the ATSSL with stakeholders
H. Hill	Senior Coordinator (*Educational Support*)	• Schedules, coordinates, oversees the preparation of, and manages the execution of activities in the SSL. • Collaborates to design simulation experiences for improved patient safety, quality, and cost efficiency. • Develops unique training models for procedural skill mastery.
P. Hillman	Simulation Operations Technician Coordinator *(Education Support)*	• Provides day-to-day support for the CSL. • Prepares high fidelity manikins and task trainers for simulation-based education sessions along with technical support. • Schedules, and coordinates sessions.
M. Cowan	Simulation Consultant *(Innovation & Research; Collaboration & Community)*	• Provides technology support to facilitate communication and optimize processes for data management. • Collaborates on national and international educational projects to facilitate the development of quality medical education and postgraduate medical simulation curricula.

OUR ROLES CONTINUED

	Role	Responsibilities
J. Rossiter	Simulation Consultant *(Innovation & Research; Collaboration & Community)*	• Designs and implements educational curricula, collaborates with educators, and leads simulation facilitator training and research. • Plans and coordinates sessions, materials, equipment, and OSCE setups.
S. Jaunin	Surgical Technician and Embalmer *(Operational Support)*	• Oversees the operational design, planning, safety orientations and support for the SSL. • Performs embalming and disarticulations. • Develops and creates hybridizing cadaveric animal tissues with dry models to improve fidelity.
S. Sellan	Prosector Preparatory Program Technician *(Operational Support)*	• Provides day-to-day support for the SPL, SSL and BDP. • Manages, coordinates, and prepares cadaveric specimens for medical educational sessions. • Maintains effective communication with the UCalgary community, ATSSL stakeholders, and donors.
V. Rasheva	Prosector Preparatory Program Technician *(Operational Support)*	• Provides day-to-day support for the SPL, SSL, and BDP, with a significant focus on prosecting. • Coordinates, and prepares cadaveric specimens for medical anatomy sessions, ensuring readiness and quality.
J. Cowie	ATSSL Body Donation Program Administrator *(Operational Support)*	• Provides professional administration of the ATSSL BDP. • Handles and oversees the embalming, preparation, and inventory management of donated cadaveric specimens for use in education programs. • Coordinates the biennial interment ceremony.
C. Hall *(Team Lead)* J. Turnbull B. McLellan	Animal Health Technicians (AHT) *(Operational Support)*	• Collaborates with physicians, manages lab logistics, operates equipment, and supports knowledge management, including IRISS. • Administers and monitors anesthesia and analgesics for large animals, ensuring ethical care during simulated medical procedures. • Coordinates and oversees ATSSL live animal surgical labs, ensuring adherence to CCAC guidelines and high animal welfare standards in the HSARC suites.

2023-2024 ATSSL EXPENDITURES

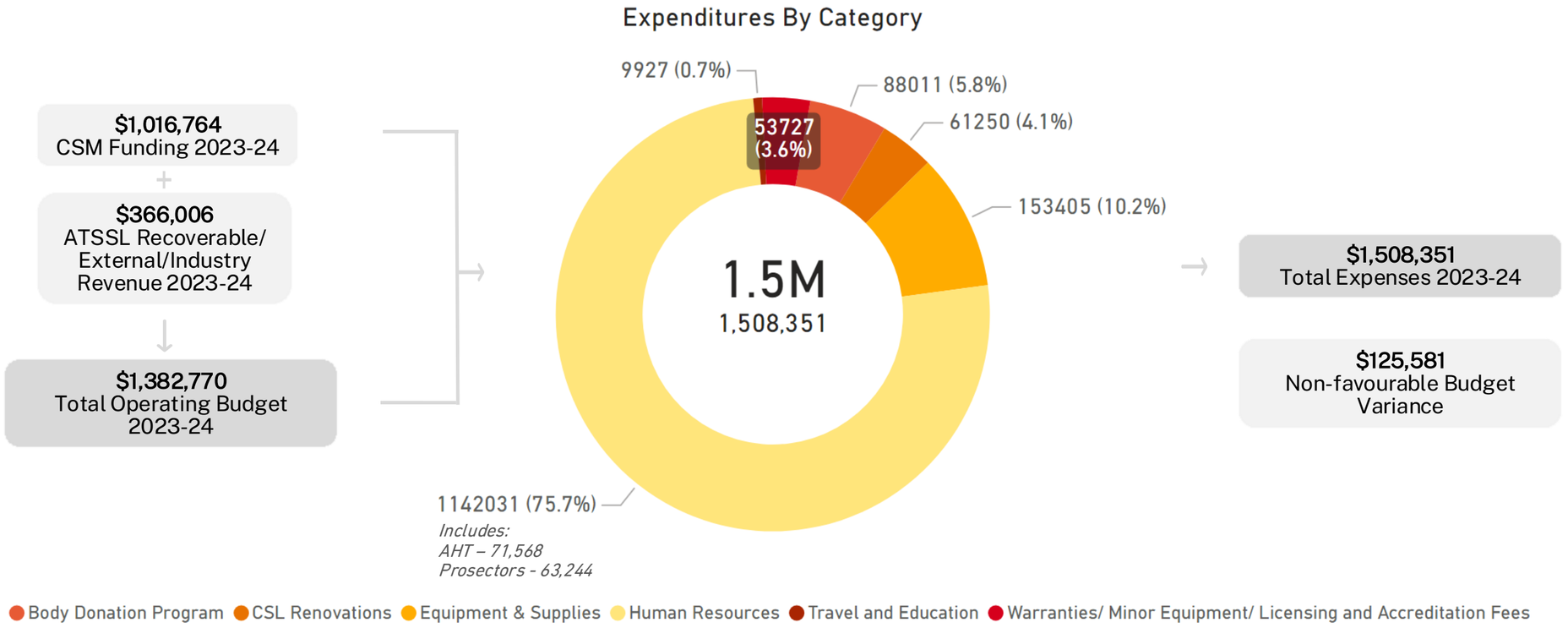
Executive Summary

The ATSSL's funding for the 2023-24 fiscal year is derived from multiple sources, including **operating budget of $1,016,764** provided by the CSM, **$447,931** from internal fee recovery, external users, and industry-sponsored symposiums, as well as **$366,006** in external revenue generated during current and previous fiscal years. This brings the **total budget to $1,382,770**.

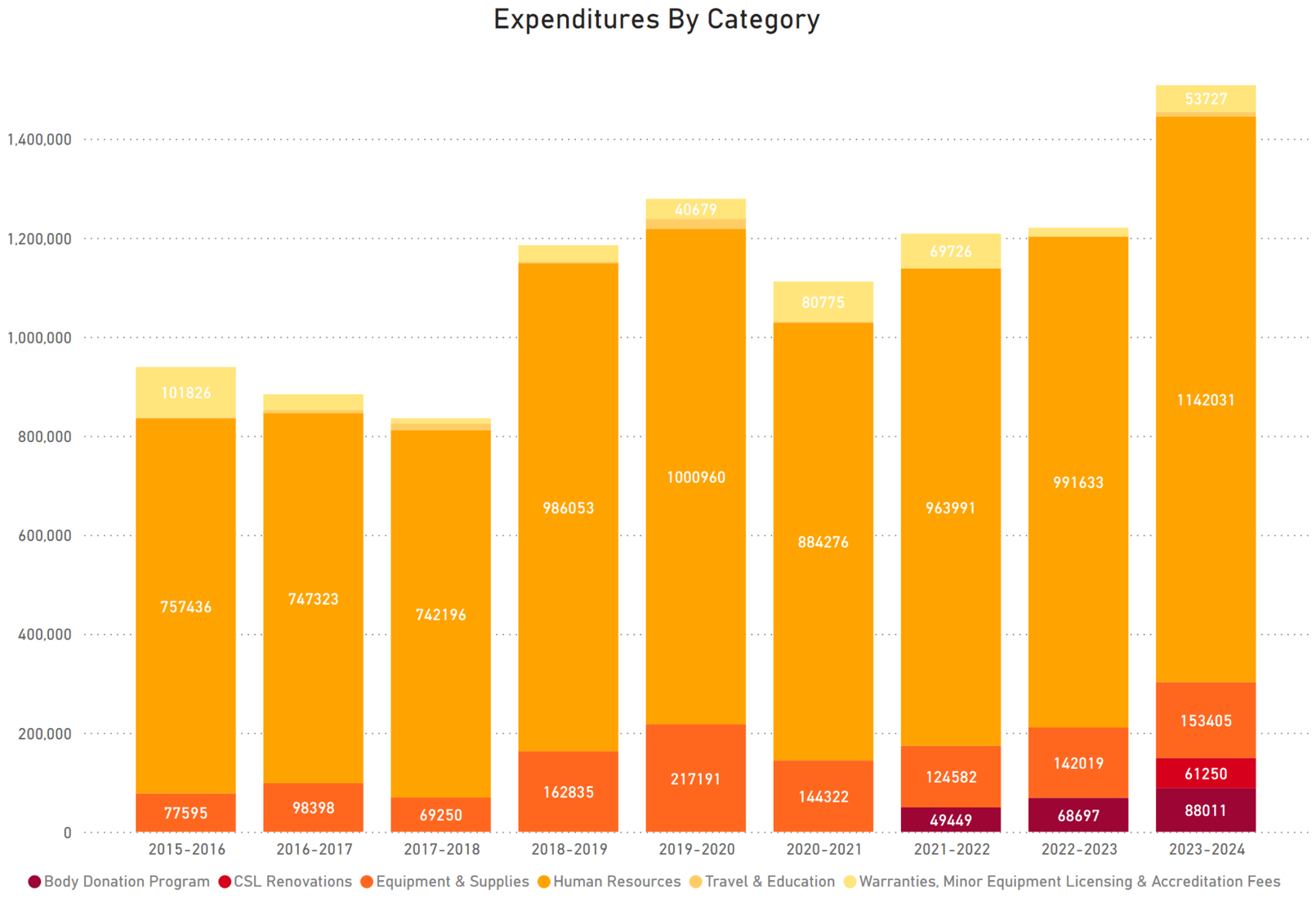
- The funds are primarily allocated toward staffing, equipment, trainers, materials, supplies, warranties, and preventive maintenance.
- Additionally, the ATSSL contributed $63,000 to support renovations of the Clinical Skills Laboratory, which is part of a larger $2,122,500 commitment by the CSM.

Non-recoverable expenditures included $71,568 for Animal Health Technicians essential for live animal simulations for senior residents and $63,244 for prosectors to maintain and update the human cadaveric prosection library, which supports UME and external users (listed under the Province of Alberta's regulated health professions and colleges Health Professions Act).

Despite these efforts, the ATSSL faced a non-favorable budget variance of **$125,581**, primarily due to unbudgeted expenses. These included replacing a critical water softener necessary for the effective operation of SSL equipment and upgrading an outdated 1996 GE Healthcare OEC 9800 Plus C-Arm with a new GE Healthcare OEC Elite CFD 31cm Digital Mobile Super C-Arm. These challenges highlight the ATSSL's ongoing efforts to maintain operational efficiency and meet the needs of its users while navigating unexpected costs.



2015-2024 ATSSL FINANCIAL TRENDS



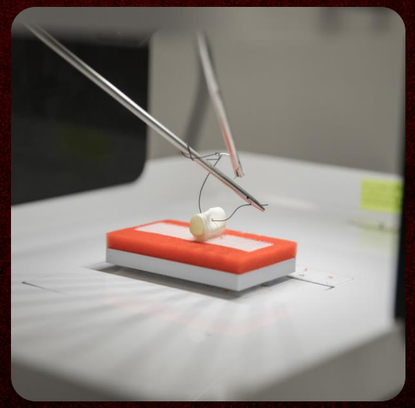
Overview

The year-over-year trends in the ATSSL data reflect a consistent reliance on multiple funding streams, including internal fee recovery, external revenue, and operating support from the CSM. While overall funding levels have remained relatively stable, external revenue generation appears to play an increasingly critical role in supplementing the operating budget.

On the expenditure side, there is a notable trend of rising costs associated with non-recoverable items, such as specialized staffing (Animal Health Technicians and Prosectors) and the replacement of aging infrastructure and equipment. These trends highlight the ATSSL's ongoing efforts to balance operational needs with the financial challenges posed by essential but non-budgeted expenditures.

Year-over-year variances demonstrate the need for continued strategic planning to ensure long-term sustainability while meeting the growing demands of users and stakeholders.

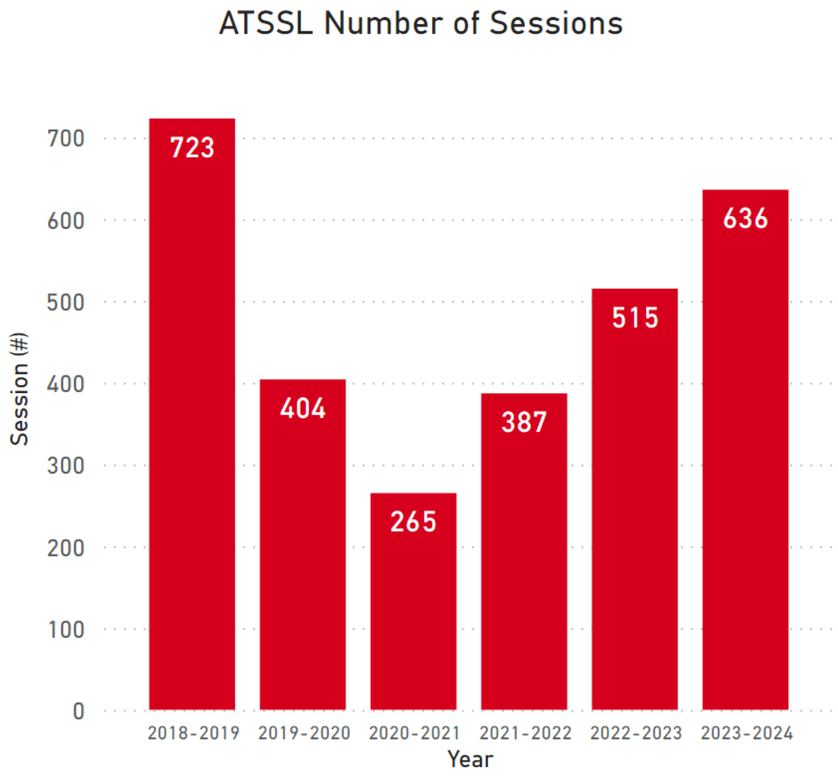
ATSSL AGGREGATE DATA

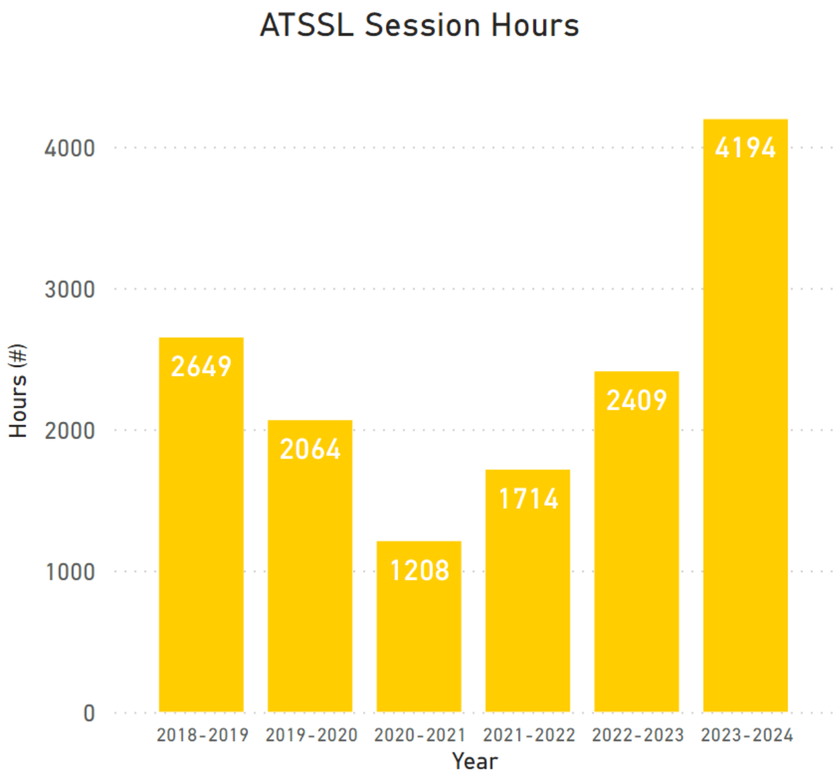


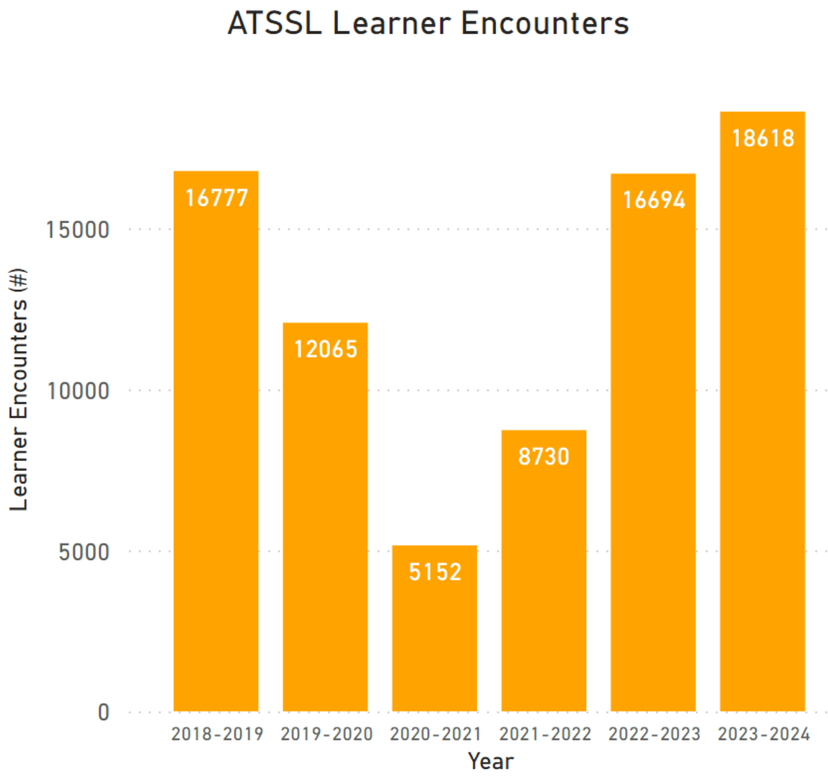
2018-2024 ACTIVITY TRENDS

Trends

- Data reflects a remarkable recovery in numbers following the challenges posed by the COVID-19.
- 2018's data does not include SPL.
- Learner encounter statistics for 2018-19 are skewed due to the substantial number of UME open labs at that time.
- Since opening in 2018, there has been a **14% decrease** in number of sessions, **37% increase** in total hours, and **10% increase** in learner encounters.
    - The structure of the sessions has changed. This is due to a reduction in the frequency of labs, achieved by lengthening the duration of each session compared to last year.







2023-2024 ACTIVITY TRENDS

Trends

- This analysis highlights the dynamic nature of the ATSSL sessions, with significant peaks and troughs that could inform future planning and resource allocation.
- Data shows a general trend of increasing UME and PGME session numbers from the beginning of the academic year, peaking mid-year, and then tapering off towards the end.
- Data comparison between 2022-2023 to 2023-2024 are as follows:
  - **19% increase** in number of sessions
  - **43% increase** in total hours
  - **10% increase** in learner encounters from 2022-2023 to 2023-2024

Totals

636

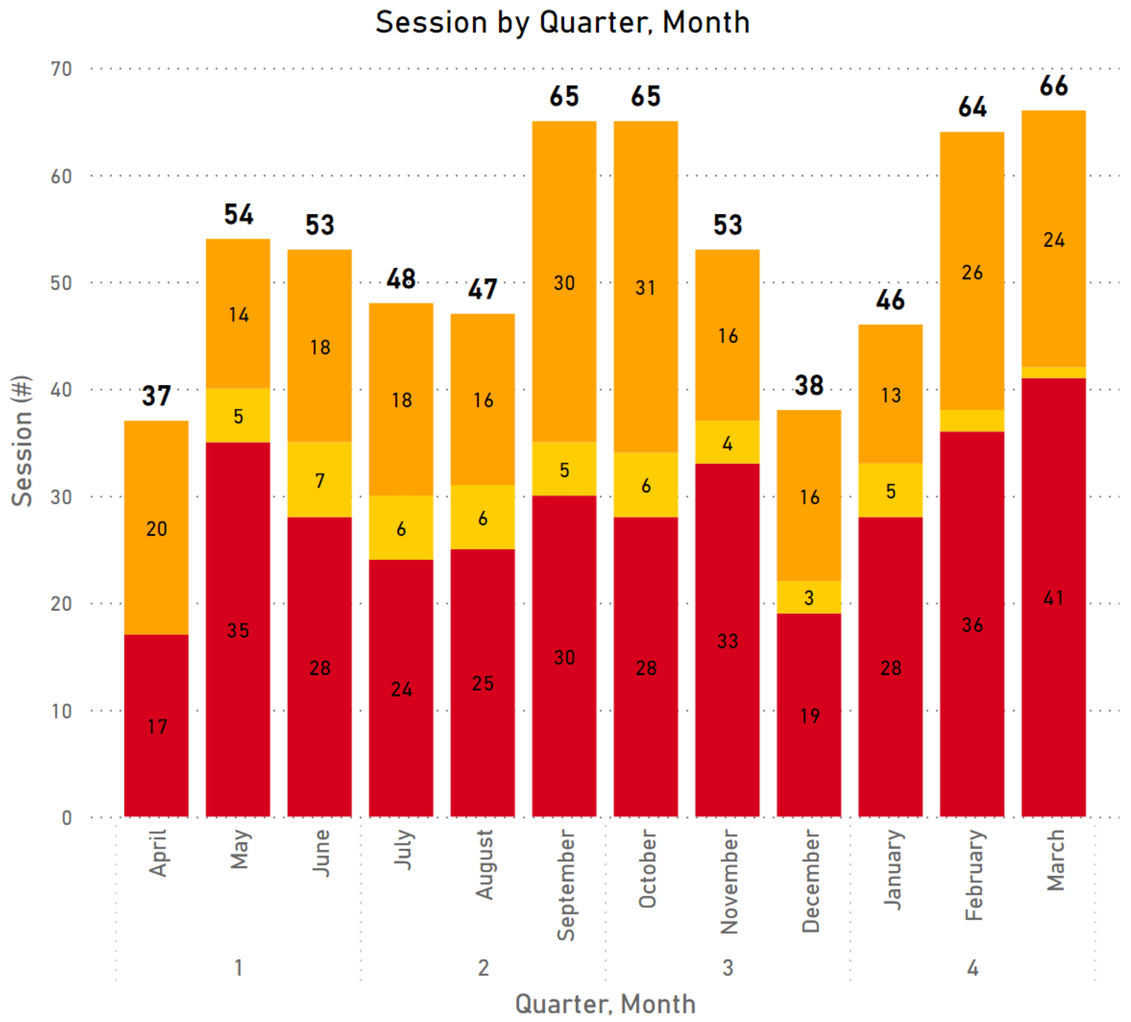
SESSIONS

4194

HOURS

18,618

LEARNER ENCOUNTERS



2023-2024 USAGE BY DEPARTMENT

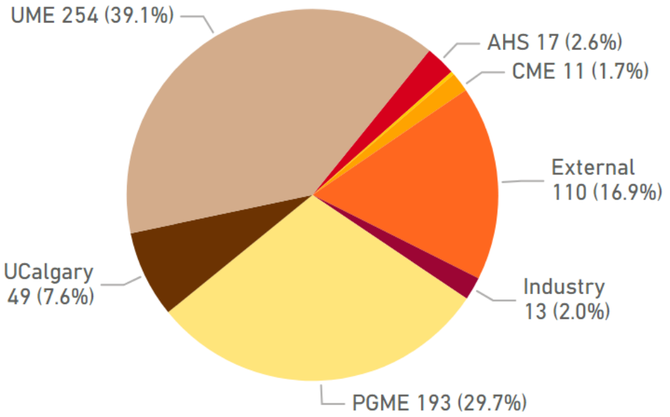
Trends

- Most of the sessions in the labs were for undergraduate (47%) and postgraduate (30%) students.
- External healthcare professionals and industry users encompass 21% of occupied lab hours.
- Most of the learner encounters are undergraduate medical students (66%) and residents (15%).

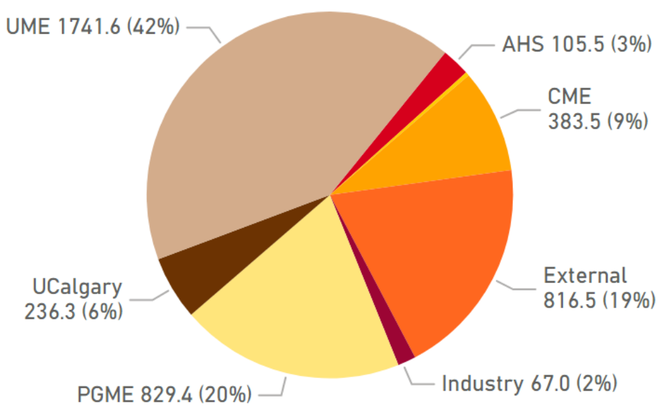
TABLE 1. 2023-24 OVERALL ACTIVITY, BY DEPARTMENT

Department	Sessions	Hours	Learner Encounters
UME	254	1,742	12,305
PGME	193	829	2,841
External	110	816.5	2,195
CME	11	383.5	108
UCalgary	49	236	951
AHS	17	105.5	110
Industry	13	67	85
ATSSL	2	14	23
Total	**649**	**4194**	**18,618**

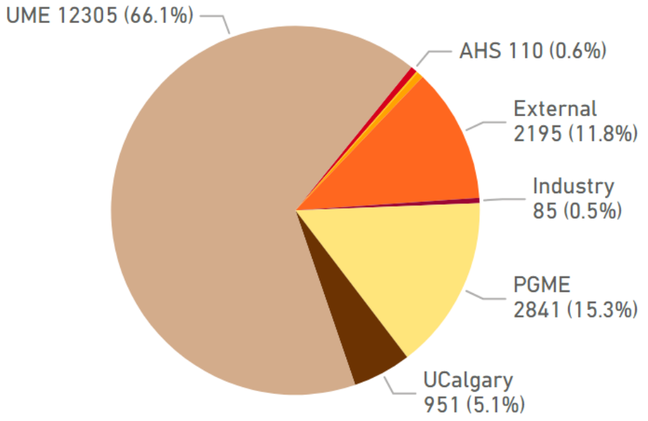
Sessions



Hours



Learner Encounters



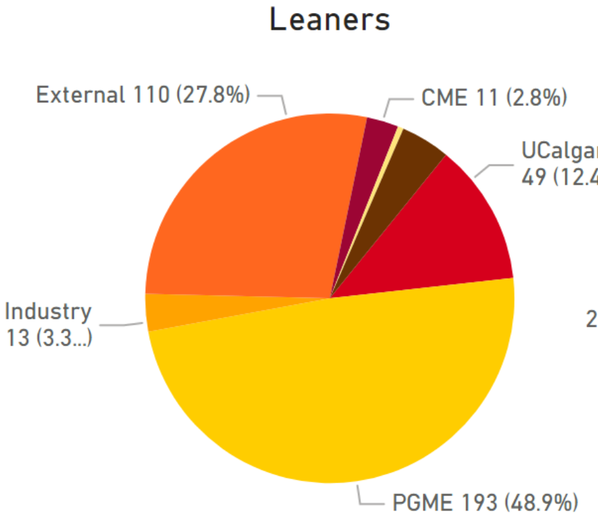
2023-2024 USAGE BY DEPARTMENT
(EXCLUDING UME)

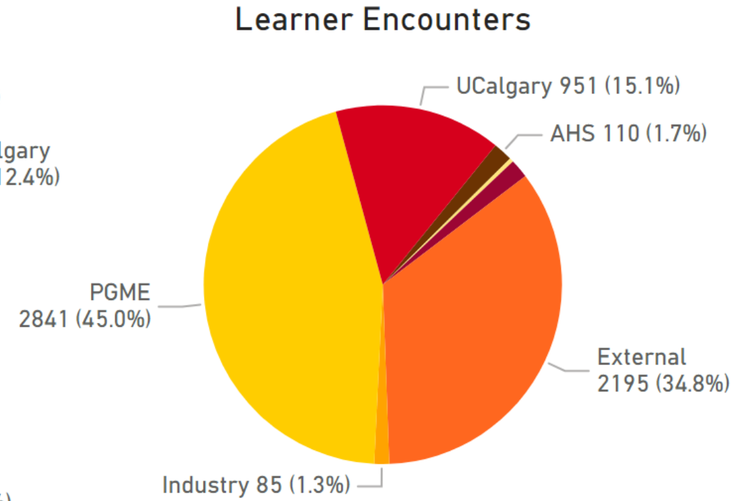
Trends

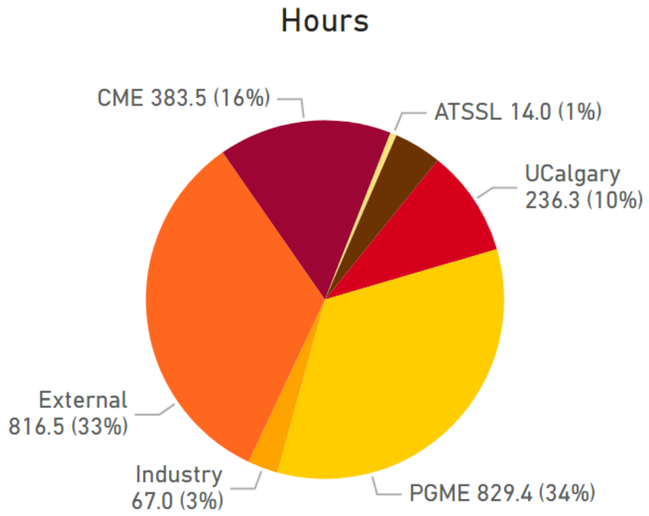
- ATSSL continues to create diverse experiential learning opportunities for health science students across different departments.
- About 45% of our learners come from PGME, 35.5% External, 15.5% UCalgary, 1.5% AHS, 1.5% CME, and 1% Industry.

TABLE 2. 2023-24 OVERALL ACTIVITY, BY DEPARTMENT EXCEPT UME.

Department	Sessions	Hours	Learner Encounters
PGME	193	829	2,841
External	110	816.5	2,195
CME	11	383.5	108
UCalgary	49	236	951
AHS	17	105.5	110
Industry	13	67	85
ATSSL	2	14	23
Total	**395**	**2,452**	**6,313**





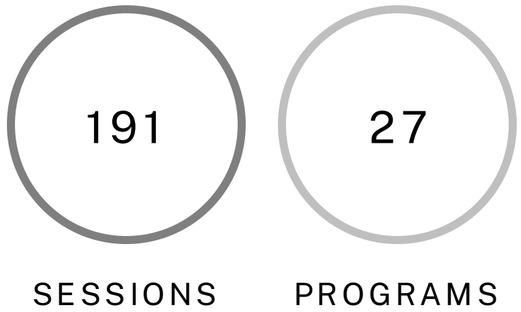


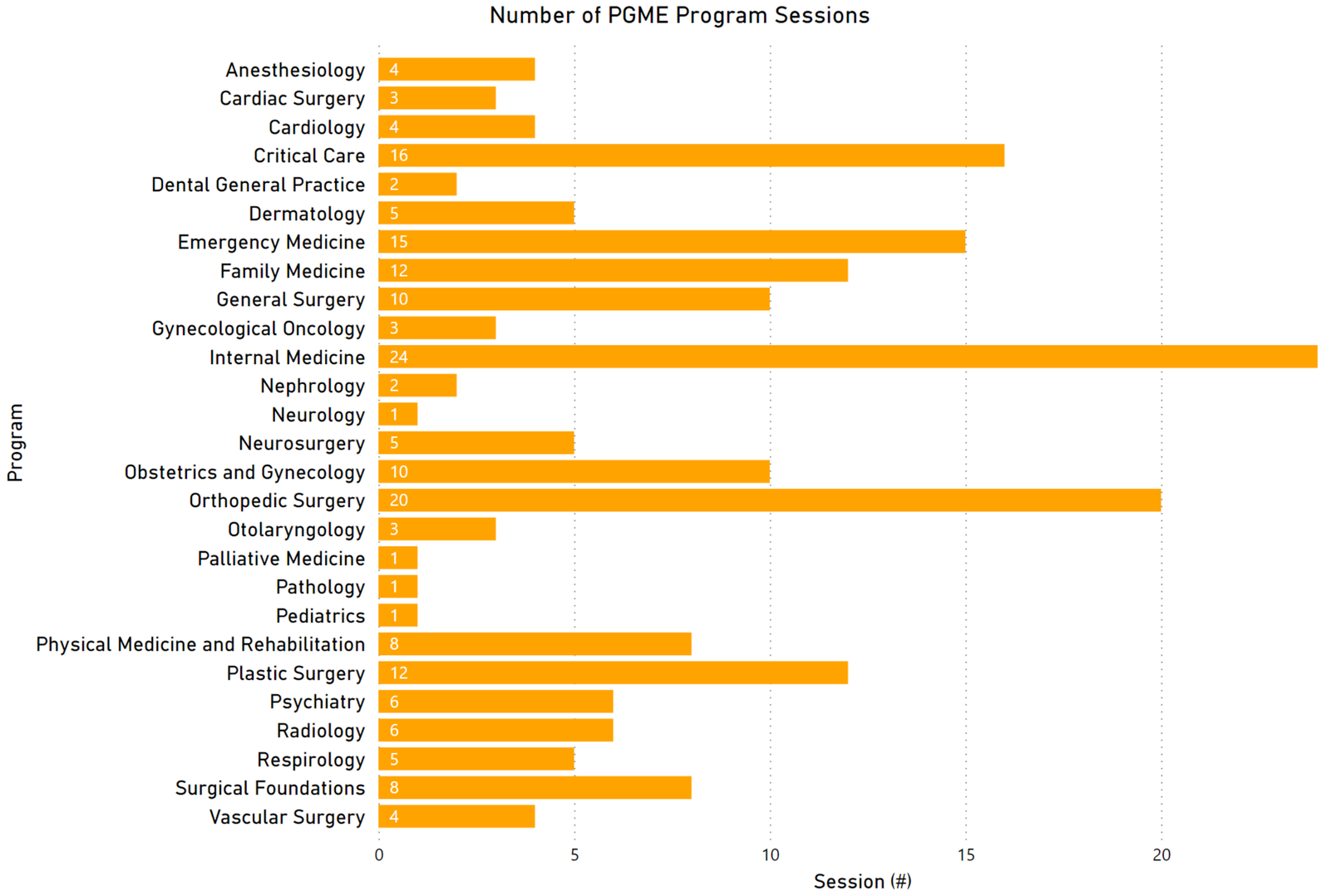
2023-2024 SESSIONS BY PGME PROGRAM

Trends

- Internal Medicine had the most sessions at 24, followed by Orthopedic Surgery and Critical Care.
- Internal Medicine represented 13% of the session count.
- 26 different UCalgary PGME programs booked sessions in the ATSSL.

Totals





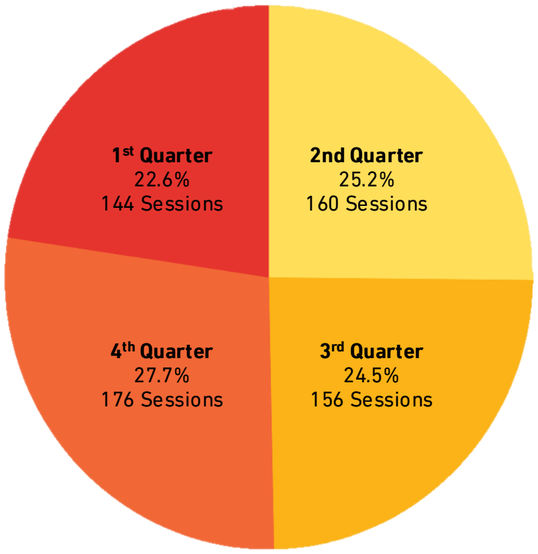
2023-2024 EXTERNAL AND INDUSTRY EVENTS

Trends

In addition to our academic offerings, the ATSSL welcomes external organizations, healthcare institutions, and industry representatives who seek a professional environment for medical education, product training, or research purposes. We offer customizable space options to suit the needs of external users, from short-term workshops to ongoing training programs. Our skilled technical and administrative staff work closely with external clients to deliver high-quality simulation-based medical education.

From 2022-2023 to 2023-2024:

- **30% increase** in External events
- **15% increase** in Industry events



FIRST QUARTER

- Advanced Trauma Life Support (ATLS)
- Sport Medicine Ultrasound Canada Conference (SMUC)
- Canadian Association of Orthopaedic Medicine (CAOM)
- University of Alberta Airway Management
- RnR Rounds
- Alberta Institute of Massage
- Vicars School of Massage
- Funeral Service – Mount Royal University
- Department of Critical Care Medicine (DCCM) Course
- Vivo Cura Health
- Trauma Nursing Core Course (TNCC)
- Prairie Point of Care Ultrasound (POCUS) – EDE Bootcamp
- Stryker Mako Lab

SECOND QUARTER

- Advanced Trauma Life Support (ATLS)
- Western Canadian Sinus Course
- Sport Medicine Ultrasound Canada Conference (SMUC)
- Canadian Massage & Manual Osteopathic Therapists Association (CMMOTA)
- Mount Royal University (MRU) - Embalming Skills Session
- Alberta Health Services (AHS)– Oral Maxillofacial Surgery Course (OMFS)
- Prollenium Pace
- Southern Alberta Institute of Technology (SAIT) - Paramedicine Lab
- Prairie Point of Care Ultrasound (POCUS)
- Makami College

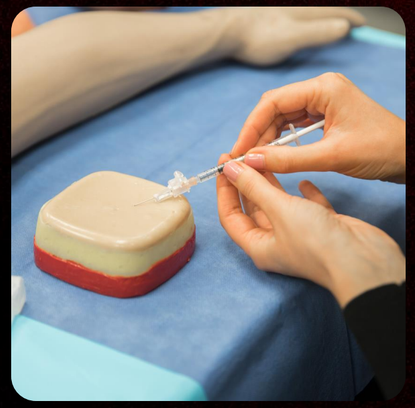
THIRD QUARTER

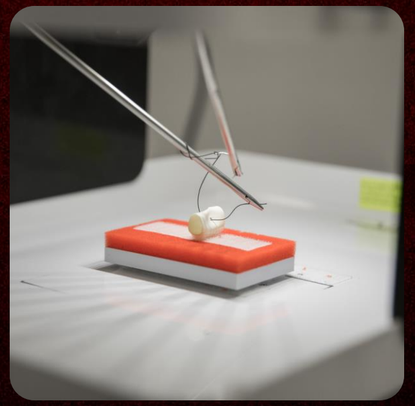
- Univeristy of Alberta Dentistry Airway Management
- Discovery Days
- Calgary Shock Symposium
- Straumann Implant Course
- STARS Critical Procedure Course
- Avier VR Physician Training
- Medtronic Ballon Kyphoplasty
- Alberta Health Services (AHS)– Oral Maxillofacial Surgery Course (OMFS)
- Alberta College of Acupuncture and Traditional Chinese Medicine (ACATCM)

FOURTH QUARTER

- Sport Medicine Ultrasound Canada Conference (SMUC)
- Advanced Trauma Life Support (ATLS)
- Prairie Point of Care Ultrasound (POCUS) – EDE Bootcamp
- Mount Royal University - Funeral Service
- Canadian Massage & Manual Osteopathic Therapists Association (CMMOTA)
- Stryker Mako
- Vicars School Of Massage
- Canadian Institute of Traditional Chinese Medicine (CITCM) Cadaver Lab Field Trip
- Prairie Point of Care Ultrasound (POCUS)

2018-2024 INDVIDUAL LABORATORY DATA





CLINICAL SKILLS LABORATORY (CSL)

FACILITY

- The CSL is a modular, multi-disciplinary medical simulation facility that can be divided into eight pods, accommodating up to 12 learners each.
- The focus is on enhancing technical skills, patient safety, and learner safety.
- The facility includes four simulation suites with control rooms for theatre-based simulation activities.
- Features include task trainers, computerized manikins, and standardized patients, providing hands-on experiential learning for knowledge consolidation and reflection.

EQUIPMENT/ACCESSORIES

- Task trainers, computerized manikins (i.e. Vimedix, PacerMan), Noelle and SimMan
- Standardized patients
- Debriefing rooms and simulation suites
- Consumables

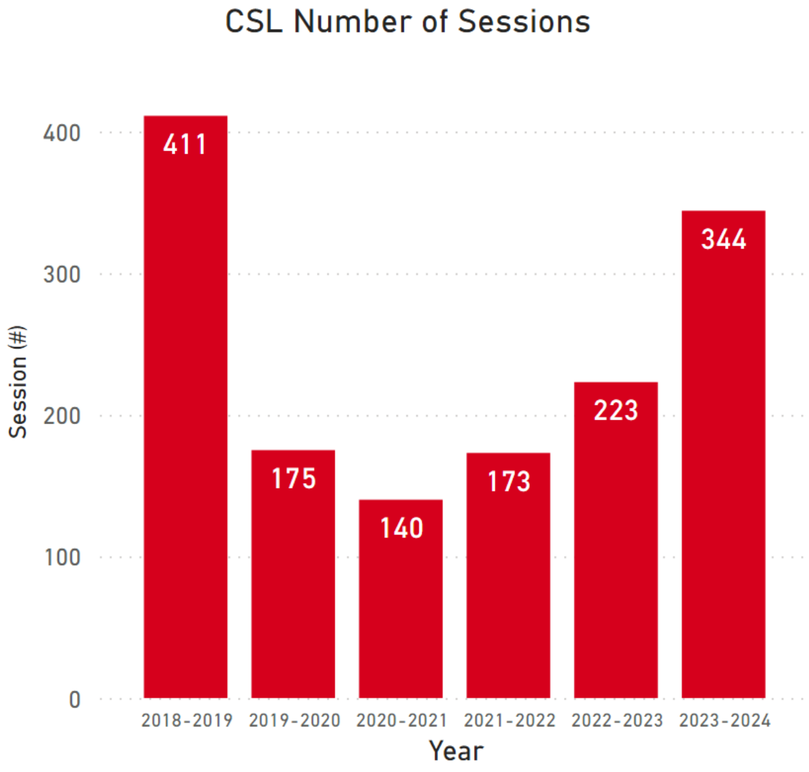
ACTIVITY

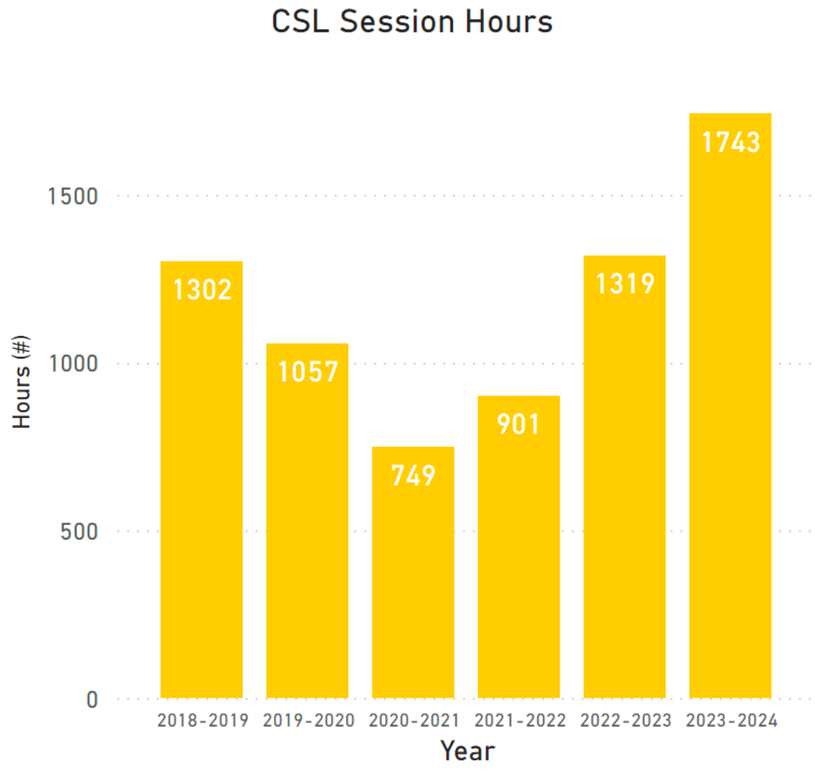
- Use of task trainers, and synthetic models
- Theatre-based simulation
- Facilitator Education Training in Simulation (FACETS)
- Clinical competencies and accredited external courses (i.e. ATLS)
- Accreditation and research

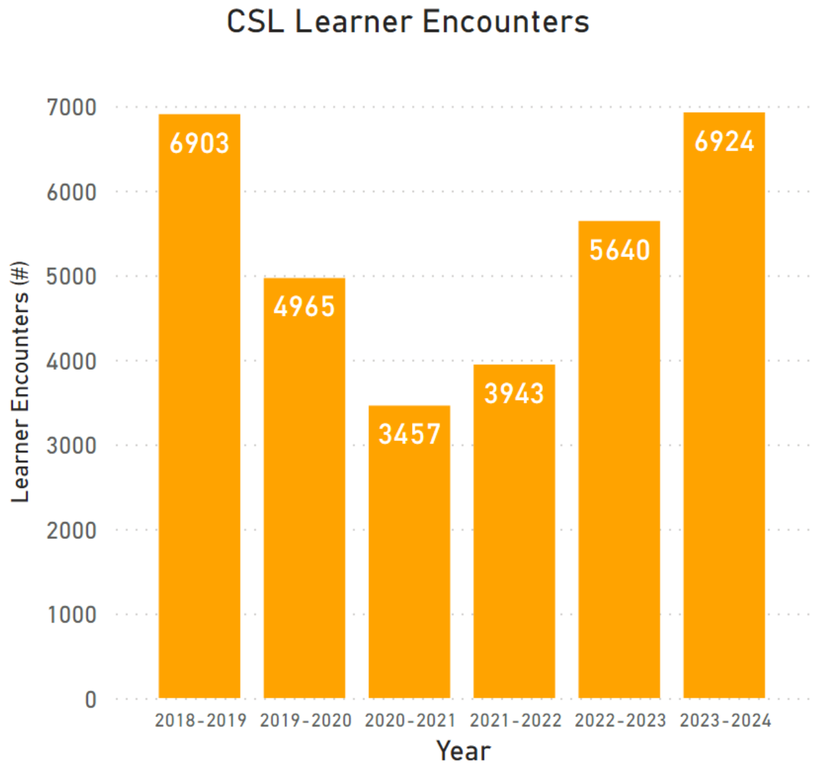
2018-2024 CSL ACTIVITY

Trends

- 2022-2023 vs 2023-2024:
  - There is a **35% increase** in number of sessions, **24% increase** in total hours, and **19% increase** in learner encounters
- 2018-2019 vs 2023-2024:
  - There is a **19% decrease** in number of sessions, **25% increase** in total hours, and **0.3% increase** in learner encounters







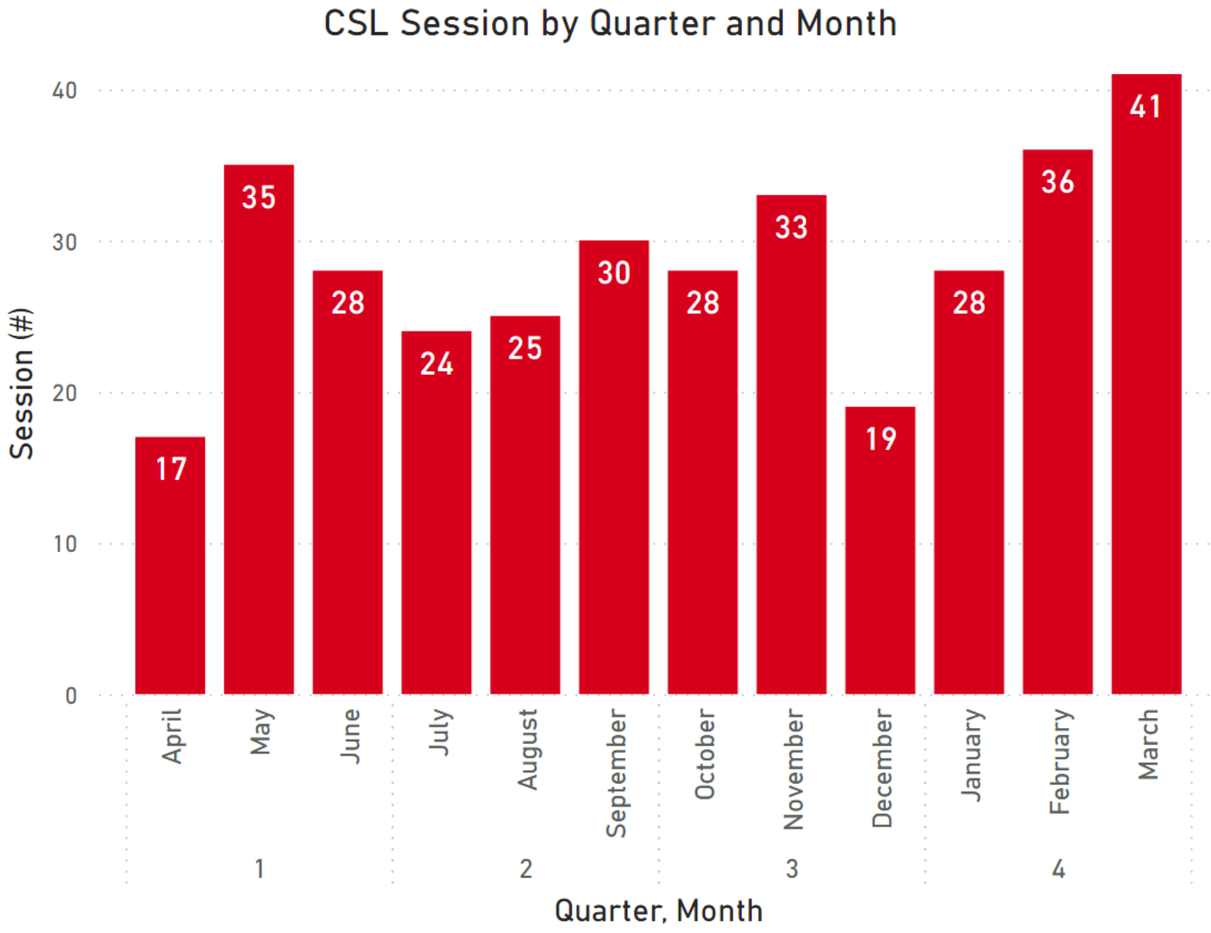
2023-2024 CSL SESSIONS

Trends

- Every 1 hour of active lab sessions requires approximately 3 hours of ATSSL operating staff hours to ensure that quality of design, preparation, implementation, and facilitation of sessions are continuously upheld
- 2023-2024:
  - 50% of the learners were from UME, followed by PGME (29%), External (15%), CME (2%), AHS (1%), ATSSL (1%), Industry (1%), and UCalgary (1%)
- 4th Quarter was the busiest with a total of 105 sessions held from January 1, 2024 to March 31, 2024, accounting for 31% of CSL overall activities in 2023-2024.

Totals

344	1724	6,924
SESSIONS	HOURS	LEARNER ENCOUNTERS

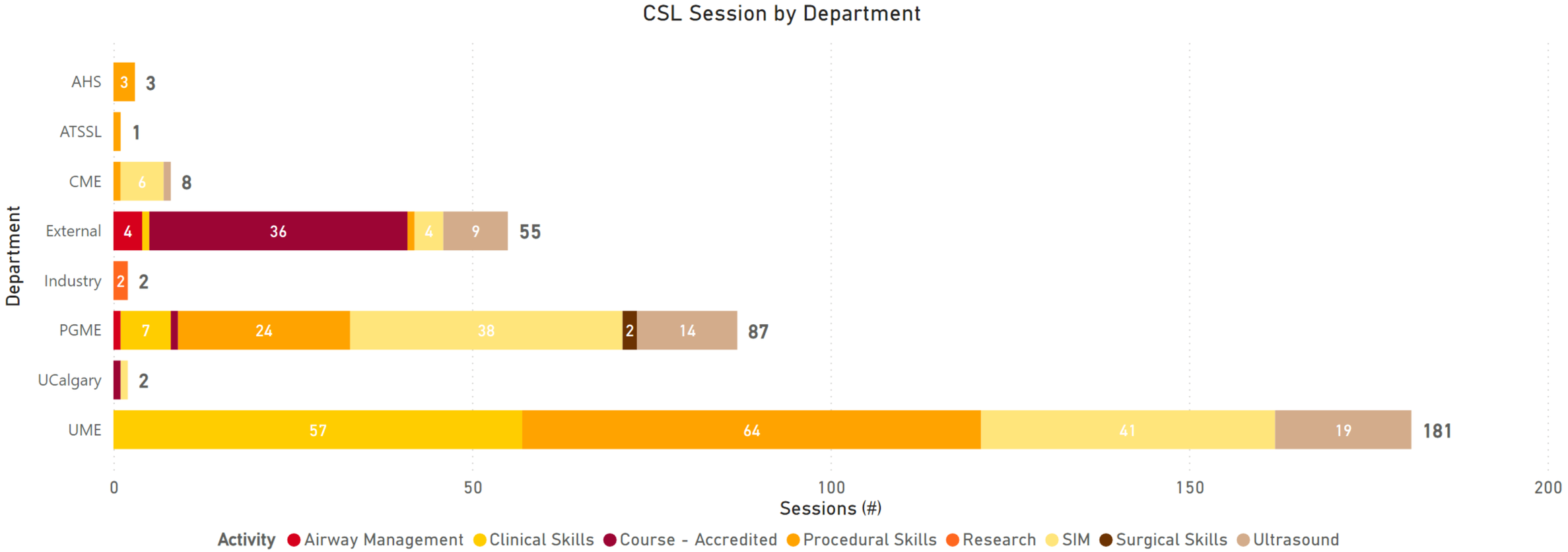


2023-2024 CSL SESSIONS BY DEPARTMENT

Trends

2022-2023 to 2023-2024:

- **13% increase** in external activities
- **44% increase** in UME activities this year
- **7% decrease** in PGME activities
- **38 sessions** are course-accredited primarily booked by external groups
- **2 new industry events** this year (PACE Prollenium and Convergence Medical Science Groups)

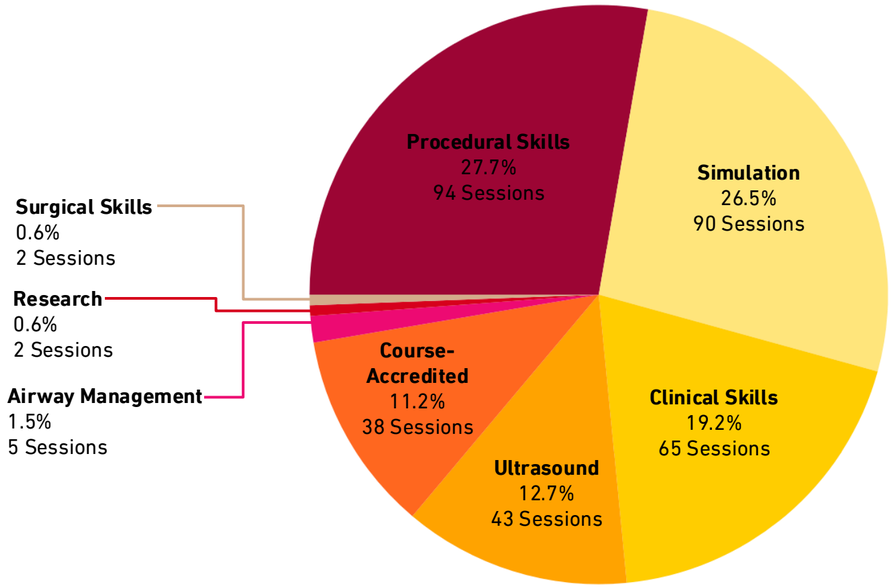


2023-2024 CSL ACTIVITIES BY DEPARTMENT

Analysis

- Educational activities range from teaching procedural skills on synthetic models to communication skills using standardized patients (actors for patients) and inter-professional team-based skills in high-fidelity simulations with computer-operated mannequins.

- 2022-2023 to 2023-2024:
  - **29% increase** in procedural skills, **47% increase** in simulation skills, **97% increase** in clinical skills, **39% increase** in ultrasound training and **21% increase** in course-accredited activities.



94 PROCEDURAL SKILLS

- 68% UME
- 26% PGME
- 3% AHS
- 1% ATSSL
- 1% CME
- 1% EXTERNAL

38 COURSE - ACCREDITED

- 95% EXTERNAL
- 2.5% PGME
- 2.5% UCALGARY

90 SIMULATION

- 46%UME
- 32% PGME
- 7% CME
- 4% EXTERNAL
- 1% UCALGARY

5 AIRWAY MANAGEMENT

- 80% EXTERNAL
- 20% PGME

65 CLINICAL SKILLS

- 87% UME
- 11% PGME
- 2% EXTERNAL

2 RESEARCH

- 100% INDUSTRY

43 ULTRASOUND

- 44% UME
- 33% PGME
- 21% EXTERNAL
- 2% CME

2 SURGICAL SKILLS

- 100% PGME

SURGICAL SKILLS LABORATORY (SSL)

FACILITY

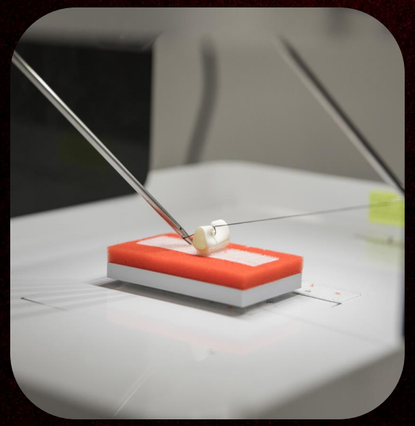
- The SSL is a training ground for medical professionals to develop and refine their surgical skills.
- Equipped with advanced surgical simulators, laparoscopic/endoscopic tools, and operating room setups, the SSL provides a realistic environment for hands-on practice.
- We prioritize user safety and is equipped with a fully functional reprocessing area to clean and sterilize instruments onsite.

EQUIPMENT

- 20 operating room stations
- Imaging technology (Radiographic -C-arms; Ultrasound Machines)
- Pan-tilt-zoom cameras

ACTIVITY

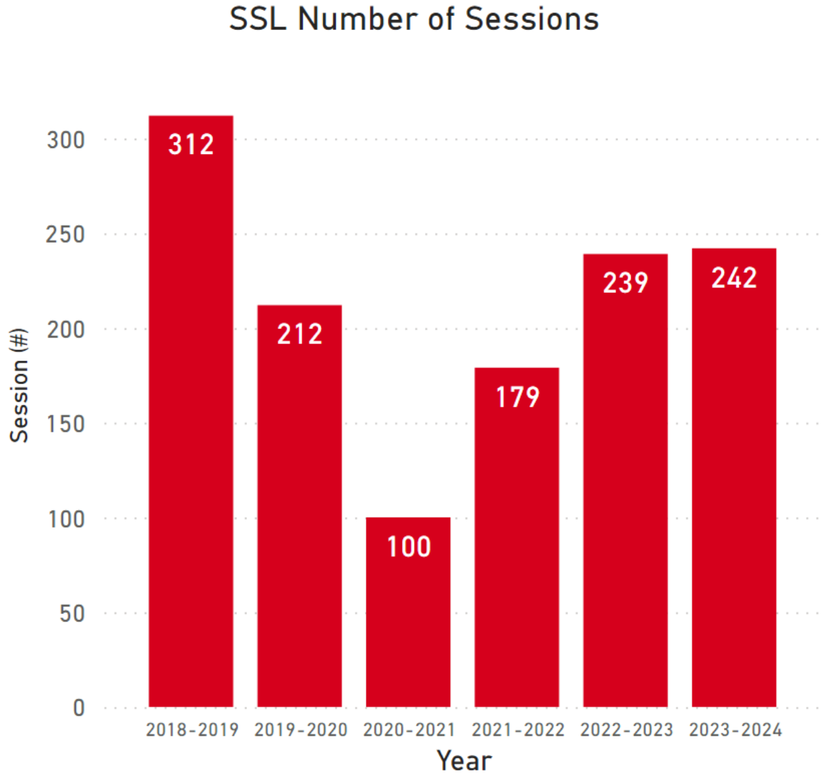
- Comprehensive training from Fundamentals of Laparoscopic Surgery (FLS TM) to complex surgical procedures.
- Use of cadaveric human and animal tissues.
- Surgical workshops and anatomy review sessions.

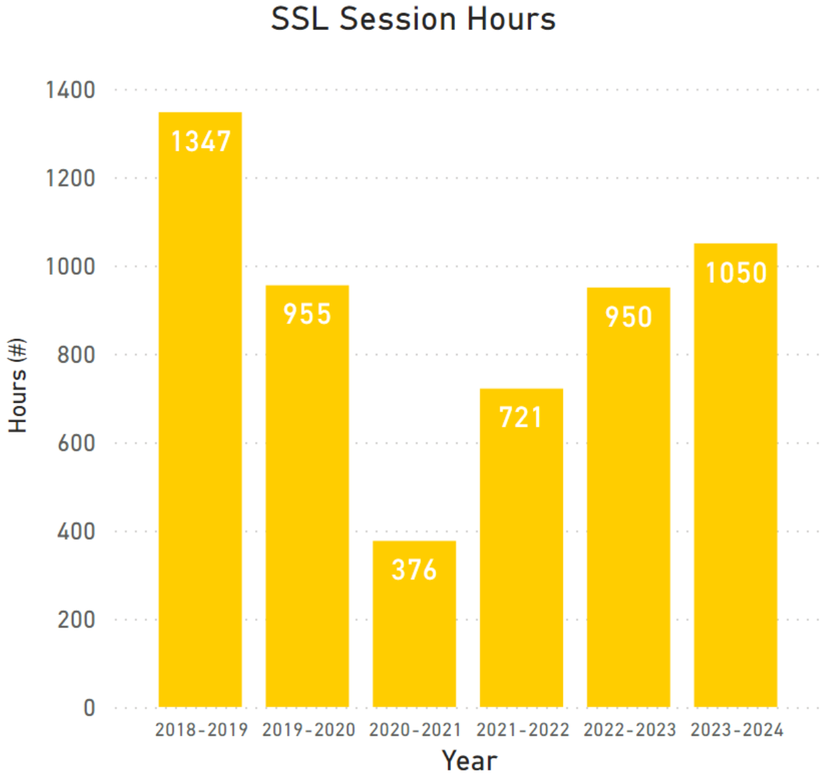



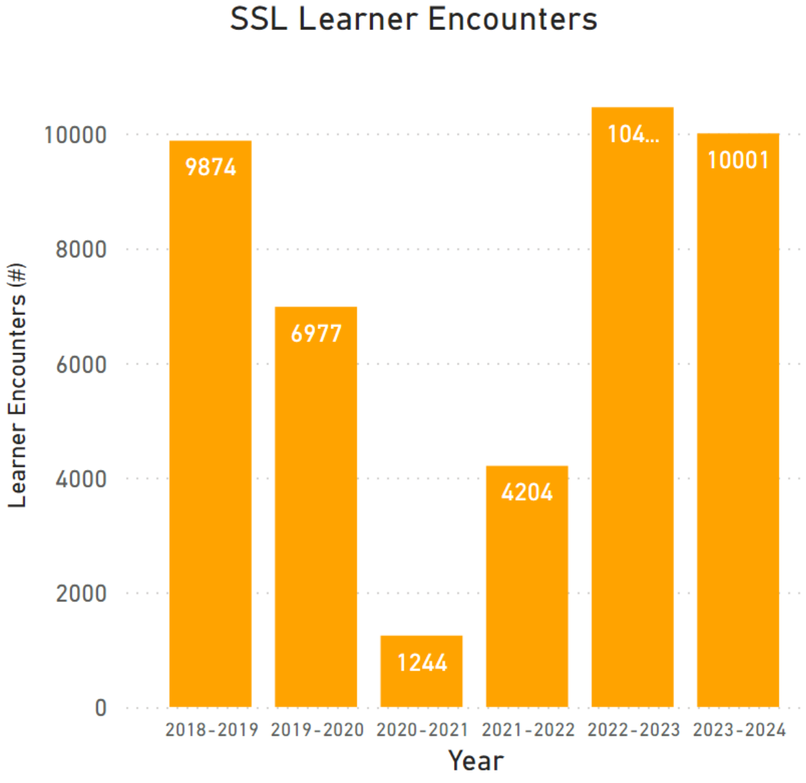
2018-2024 SSL ACTIVITY

Trends

- 2022-2023 vs 2023-2024:
  - **1.3% increase** in number of sessions, **11% increase** in total hours and **4% decrease** in learner encounters.
- 2018-2019 vs 2023-2024:
  - **9% decrease** in number of sessions, **28% increase** in total hours, and **1.3% increase** in learner encounters.







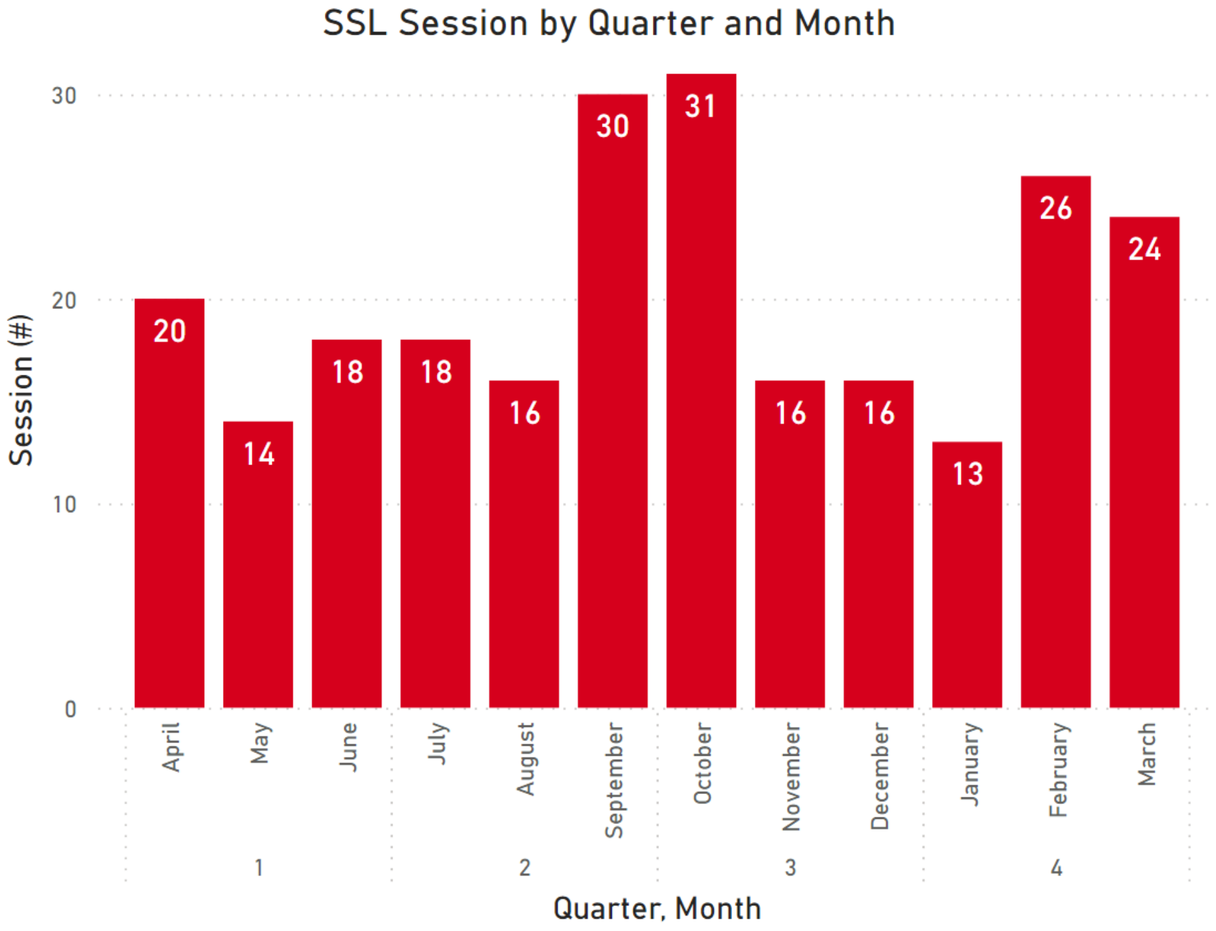
2023-2024 SSL SESSION, BY QUARTER

Trends

- Every 1 hour of active lab sessions requires approximately 3 hours of ATSSL operating staff hours to ensure that quality of design, preparation, implementation and facilitation of sessions are continuously upheld.
- 69% of the learners were from UME, followed by PGME (11%), External (10%), UCalgary (7%), Industry (0.5%), AHS (0.5%), and ATSSL (2%).
- Second Quarter was the busiest with a total of 64 Sessions which was held from July 1, 2023 to September 30, 2023 accounting for 26% of SSL overall activities in 2023-2024.

Totals

242	1050	10,001
SESSIONS	HOURS	LEARNER ENCOUNTERS

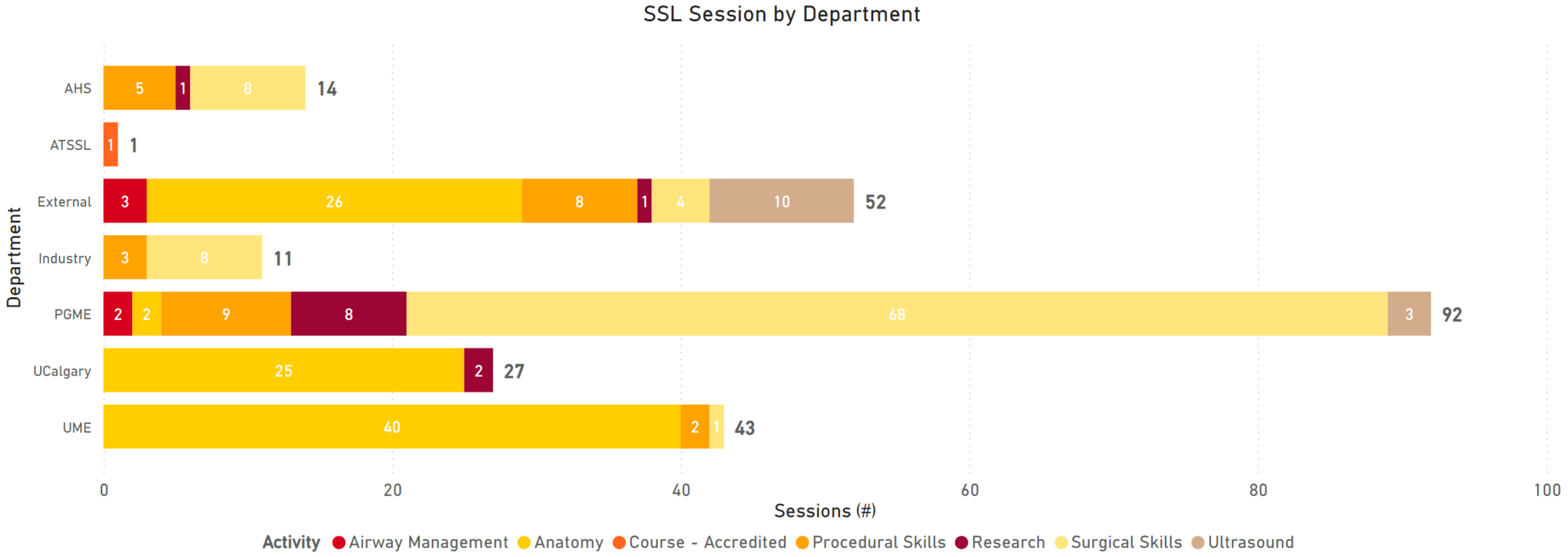


2023-2024 SSL SESSIONS, BY DEPARTMENT

Trends

2022-2023 to 2023-2024:

- **30% increase** in external activities.
- **35% decrease** in UME activities this year (2022-23 58 sessions, the new Re-Imagining Medical Education (RIME) curriculum started on July 1, 2023).
- **26% decrease** in PGME activities (2022-23 58 sessions).

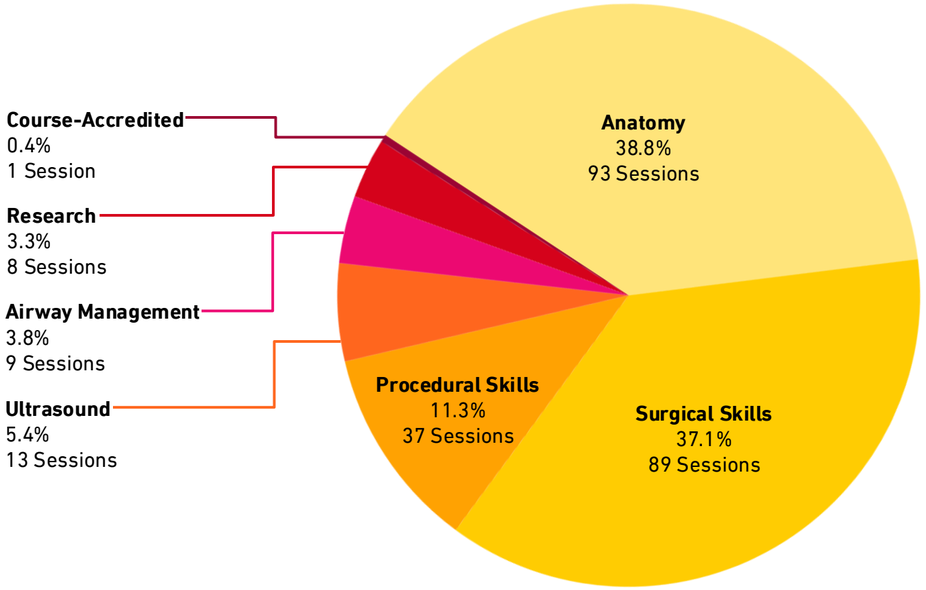


2023-2024 SSL ACTIVITIES BY DEPARTMENT

Trends

2022-2023 to 2023-2024:

- 4% increase in Anatomy, 50% increase in Procedural and 30% increase in Ultrasound Skills.



93 ANATOMY

- 43% UME
- 28% EXTERNAL
- 27% UCALGARY
- 2% PGME

89 SURGICAL SKILLS

- 76% PGME
- 9% INDUSTRY
- 9% AHS
- 4.5% EXTERNAL
- 1.1% UME

27 PROCEDURAL SKILLS

- 33% PGME
- 30% EXTERNAL
- 18% AHS
- 11% INDUSTRY
- 8% UME

13 ULTRASOUND

- 77% EXTERNAL
- 23% PGME

9 AIRWAY MANAGEMENT

- 88% PGME
- 12% EXTERNAL

8 RESEARCH

- 37.5% EXTERNAL
- 25% PGME
- 25% UCALGARY
- 12.5% AHS

1 COURSE-ACCREDITED

- 100% ATSSL

SPECIAL PROCEDURES LABORATORY (SPL)

FACILITY

- - The SPL focuses on anatomical sciences like developmental biology, gross anatomy, and neurobiology.
- - Teaching tools include embalmed and plastinated cadaveric prosections, plastic models, and a 3D atlas.
- - The facility accommodates small groups of up to 30, with dedicated areas for gross anatomy teaching and cadaver dissections.

EQUIPMENT

- Embalmed and plastinated human cadaveric material
- Anatomy plastic models, and 3D atlas
- Embalming room

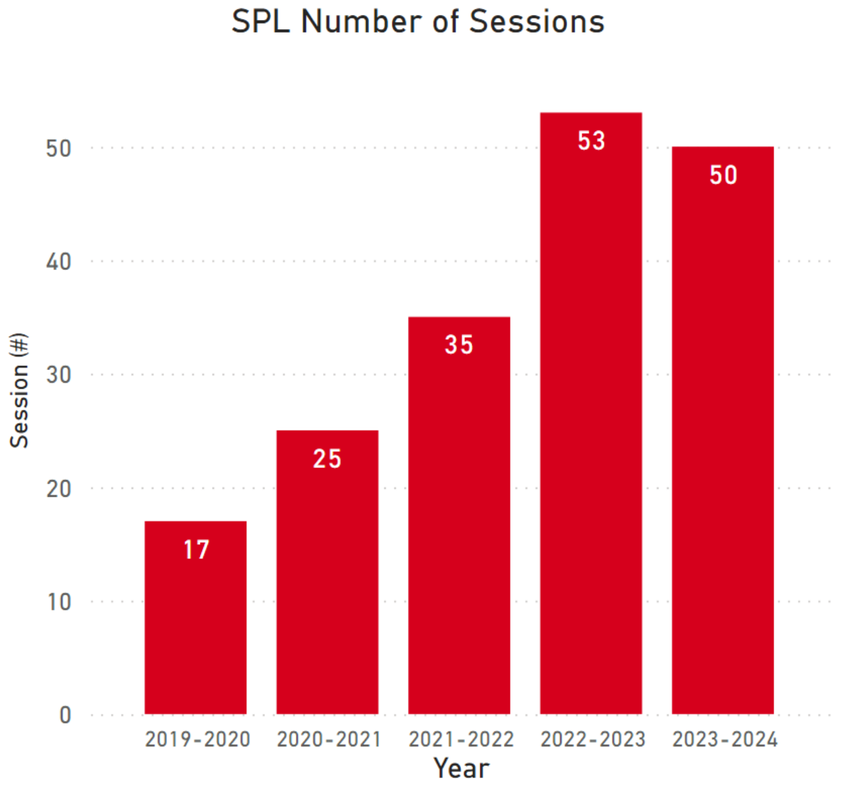
ACTIVITY

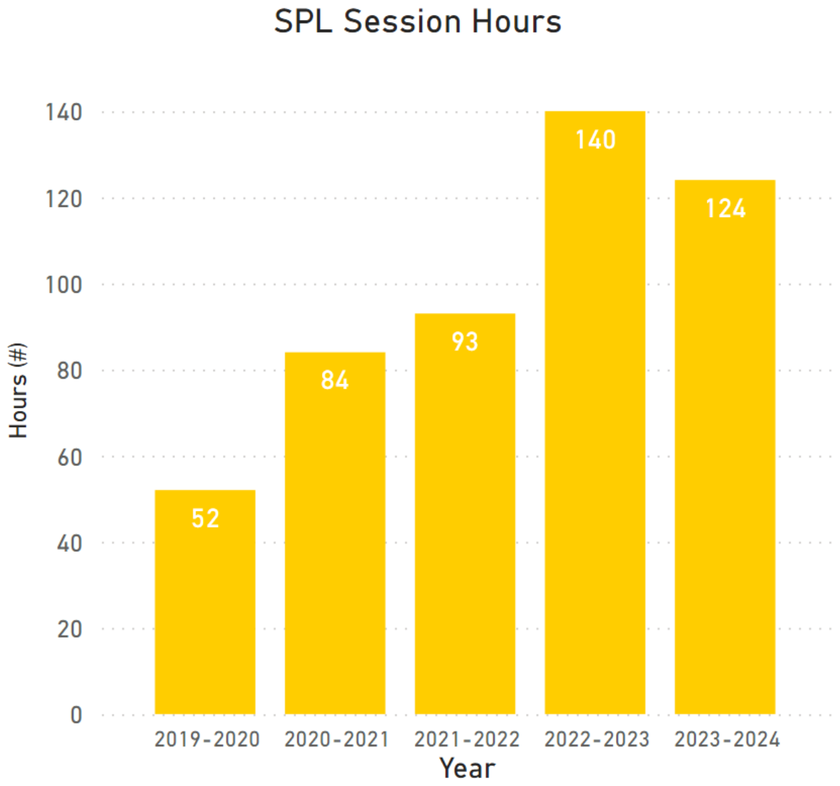
- Gross anatomy reviews
- Cadaveric dissection labs

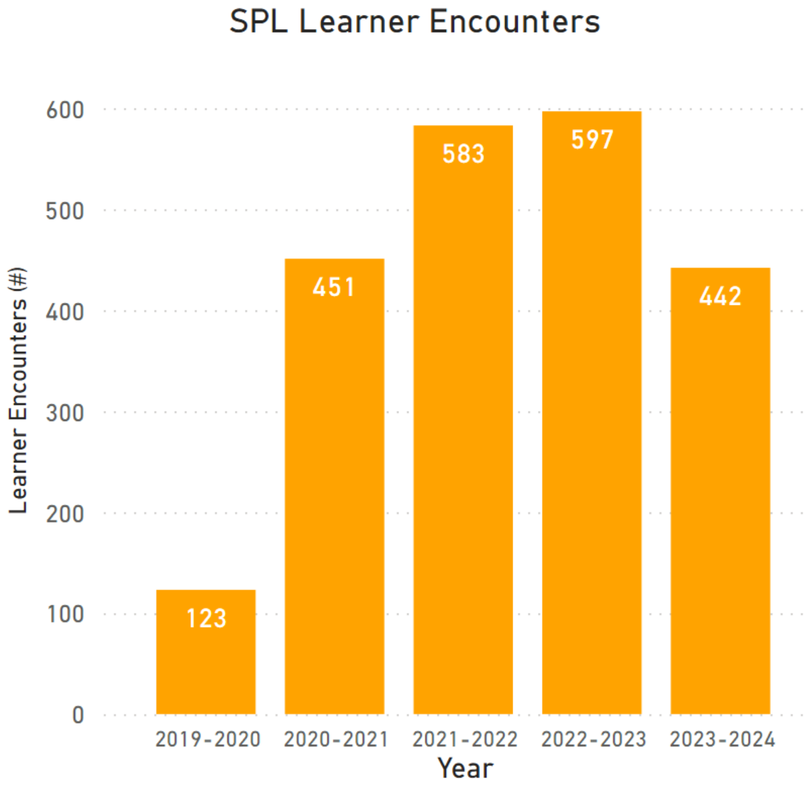
2018-2024 SPL ACTIVITY

Trends

- 2022-2023 vs 2023-2024:
  - **6% decrease** in number of sessions, **13% decrease** in total hours and **35% decrease** in learner encounters.
- 2018-2019 vs 2023-2024:
  - **66% increase** in number of sessions, **60% increase** in total hours, and **72% increase** in learner encounters.







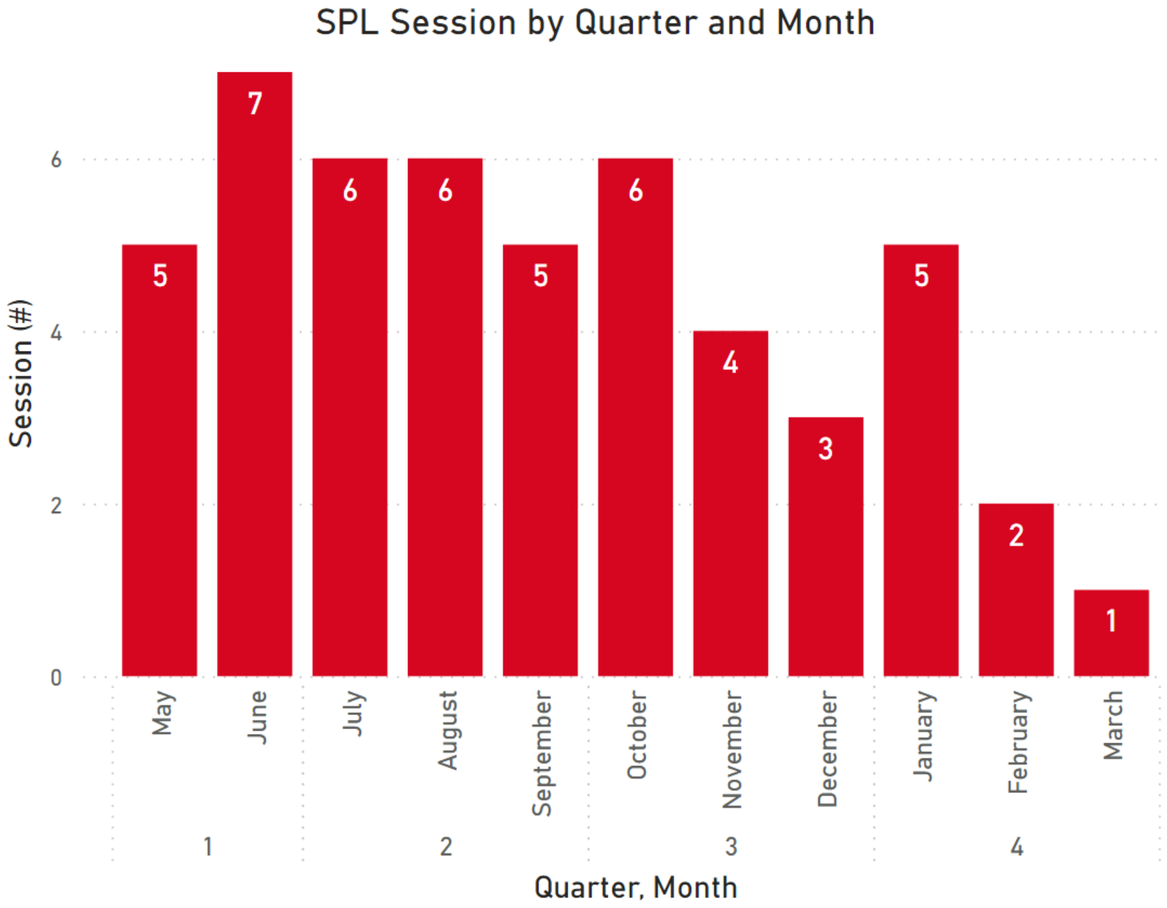
2023-2024 SPL SESSION BY QUARTER

Trends

- SPL offers primarily anatomy review sessions to staff, residents, medical students, and select specialty groups. The SPL aims to foster a conceptual understanding of human anatomy.
- 45% of the learners were from UCalgary undergraduate and postgraduate programs, followed by PGME (23%), UME (22%) and external (10%).
- First Quarter was the busiest with a total of 18 Sessions accounting for 36% of SPL overall activities in 2023-2024.

Totals

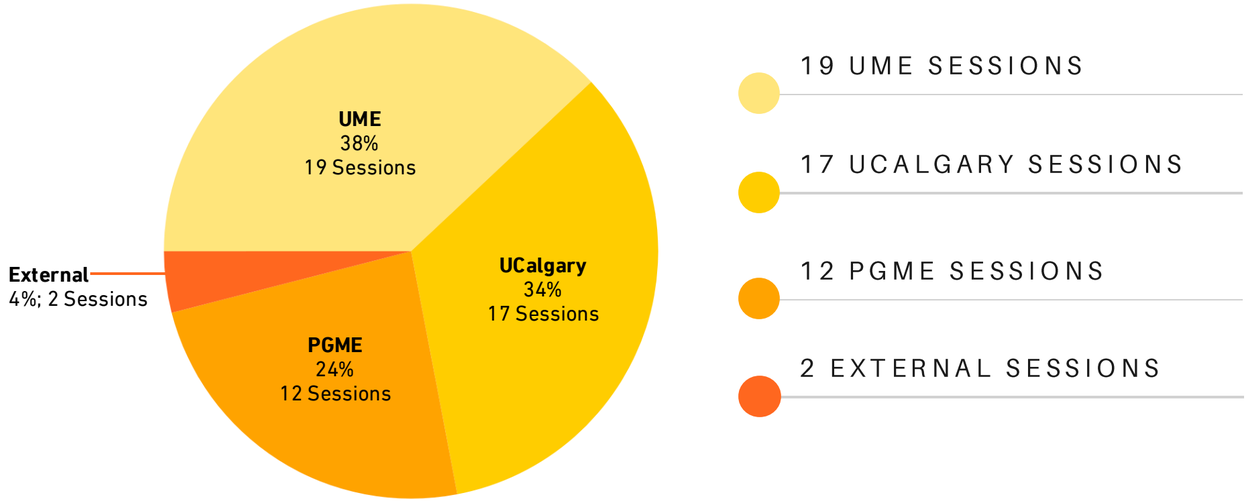
50	124	442
SESSIONS	HOURS	LEARNER ENCOUNTERS



2023-2024 SPL ANATOMY ACTIVITY BY DEPARTMENT

Gross Anatomy Lab Review Sessions

- Gross Anatomy Review Sessions are offered by the ATSSL.
  - These sessions are delivered by qualified anatomy instructors using embalmed and prepared human cadavers, and typically last for 3 hours.
  - This invaluable experience will allow for learners to review musculoskeletal, cranial and visceral anatomy pertinent to their curriculum.
  - This learning experience can only occur due to the generosity of the individuals and their families that have donated their bodies.
- 38% of the learners were from UME, 34% other UCalgary, 24% PGME and 4% External groups



ATSSL LIVE ANIMAL SURGICAL LABORATORY (LASL)

FACILITY

- The ATSSL Live Animal Surgical Laboratory and utilizes the Health Science Animal Resource Centre (HSARC) space for surgical labs and animal storage.
- This facility provides advanced training for senior residents, using porcine and ovine models to help them master essential surgical skills.
- The Animal Health Technicians (AHT) at ATSSL coordinate live animal surgical labs

ACTIVITY

- Provides infrastructure and expertise in laboratory animal care and use for biomedical research.
- Operations meet or exceed standards set by the Canadian Council on Animal Care (CCAC) policies.
- Ensure the ethical and humane use and responsible care of animals in research, teaching, and testing at the UCalgary in accordance with applicable laws, guidelines, and regulations.
- The HSARC occupies a footprint totaling more than 4600 square metres.

GOALS

- Scientific merit and ethical review of animal-based research
- Pedagogical merit of live animal-based teaching and training

SURGICAL LABORATORIES

- Advanced Trauma Operative Management (ATOM) / Definitive Surgical Trauma Care (DSTC) – Baxter Floseal Lab
- General Surgery Laparoscopic Skills Session- Emergency Surgical Airway / Front of Neck- Porcine Model
- Rigid Bronchoscopy Training Program - Swine Model Simulation Training
- Optimizing cardiology in cardiac surgery residents under Cardiopulmonary Bypass (CPB) in porcine model Surgical Training
- Laparoscopic surgical skills using Porcine model
- Extracorporeal life support Pediatric General Surgery

END-USERS

- Emergency Family Medicine and Critical Care Family Medicine
- General Surgery
- Interventional Pulmonary Medicine - Respirology
- Cardiac Surgeon Residents
- Pediatric General Surgery

2023-2024 LASL OVERALL ACTIVITY

Trends

Data comparison between 2022-2023 to 2023-2024 are as follows:

- **13% increase** in lab hours .
  - Rigid Bronchoscopy is a new activity this year.
  - In 2022-23, Extracorporeal Life Support (ECLS) was held.
- **13% increase** in number of learners.
- **29% decrease** in staff hours.

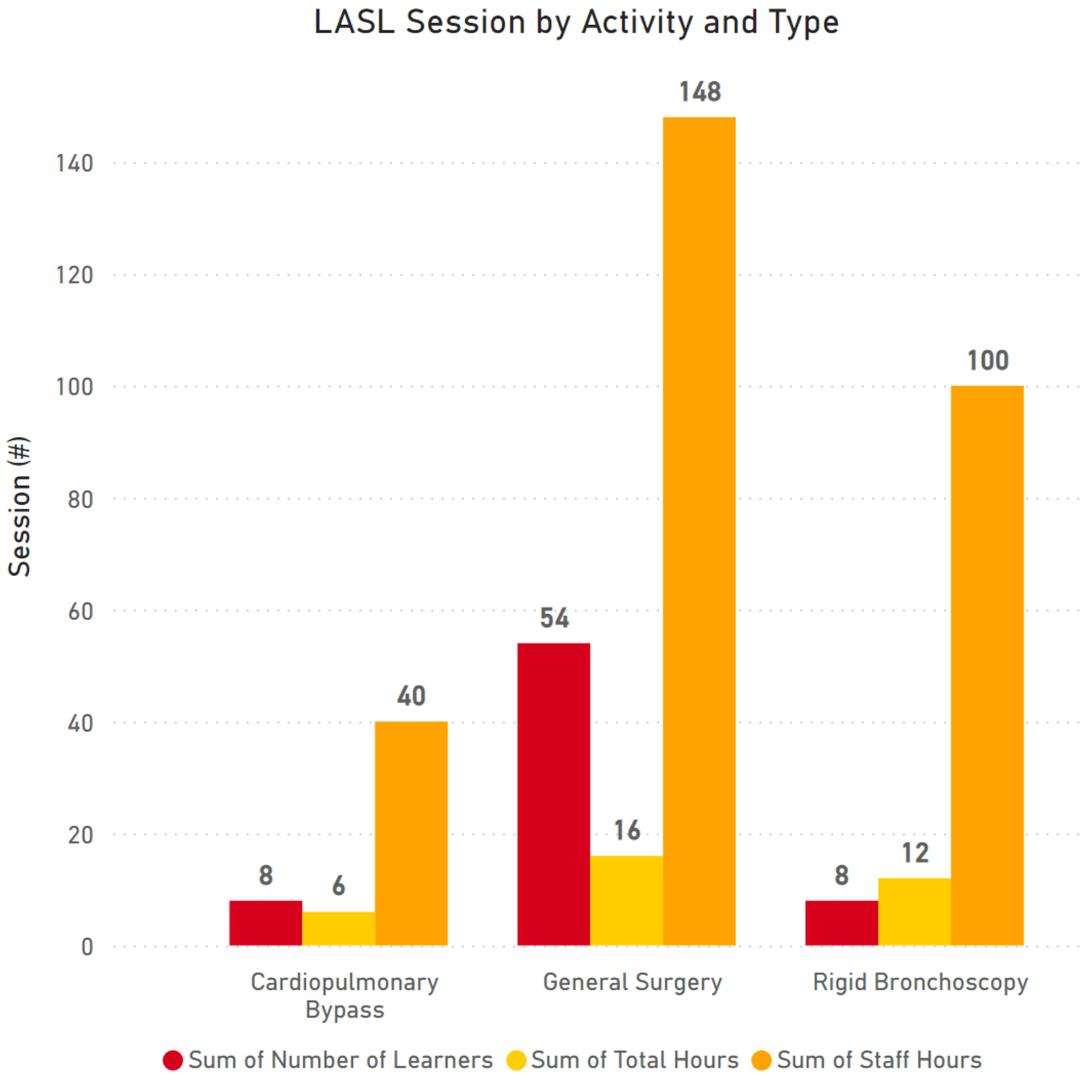
TABLE 3. LASL'S 2023-24 OVERALL ACTIVITY, BY LAB HOURS, LEARNERS AND STAFF HOURS

34 Lab Hours* (9 Sessions; 3 Activities)	
70 Learners	
General Surgery	77.1%
Cardiac Surgery	11.4%
Interventional Pulmonary Medicine - Respirology	11.4%
288 Staff Hours	
General Surgery	51.4%
Rigid Bronchoscopy	34.7%
Cardiopulmonary Bypass	13.9%

**Total lab hours does not include operations / logistics such as preparation (anesthetization), setup and takedown times*

TABLE 4. LASL'S ACTIVITY OPERATION SCHEDULE BREAKDOWN

Session	Schedule (Hours)	Total Hours	Staff
Cardiopulmonary Bypass (CPB)	Set-up: 30 Lab: 50 Take-down: 10	90	5 Techs
General Surgery	Set-up: 30 Preparation/Anesthetization: 20 Lab: 20 Take-down: 8	78	5 Techs
Rigid Bronchoscopy	Set-up: 10 Lab: 16 Take-down: 4	30	2 Techs



ATSSL BODY DONATION PROGRAM (BDP)

UNIVERSITY OF CALGARY

FACILITY

- The ATSSL BDP offers individuals in various healthcare disciplines and training levels the chance to explore cadaveric human body.

COMMITMENT

- Our commitment to providing lifelike training at every educational phase is aimed at cultivating exceptionally skilled professionals.

APPROACH

- Our approach to donor care is characterized by unwavering dignity, respect, and a strong emphasis on empathy.

DONATION

- It is important to note that the learning experiences offered are only made possible by the generosity of individuals and their families who donate their bodies to the ATSSL BDP.
- The program coordinates the acceptance and preparation of donated bodies for medical education and research purposes.
- The act of donation is greatly appreciated, as it contributes to the education and ongoing professional development of healthcare practitioners, allowing them to develop proficient clinical skills and surgical techniques that cannot be replicated by task trainers and manikins.
- To learn more about this program, please visit: *Body Donation Program*

COMMEMORATION SERVICE

- Annually, the ATSSL BDP receives 60-70 donors, and notably, 11,000 individuals have formally expressed their *intention to donate* in the program over the past 50 years.
- Biennially, the BDP orchestrates a graveside commemoration service at Queen's Park Cemetery.
- This event provides an opportunity for the UCalgary learners and staff along with the loved ones of those who have generously contributed their bodies to medical education to gather and pay their respects.
- It is at this poignant occasion that many of the cremated remains find their resting place.

60-70

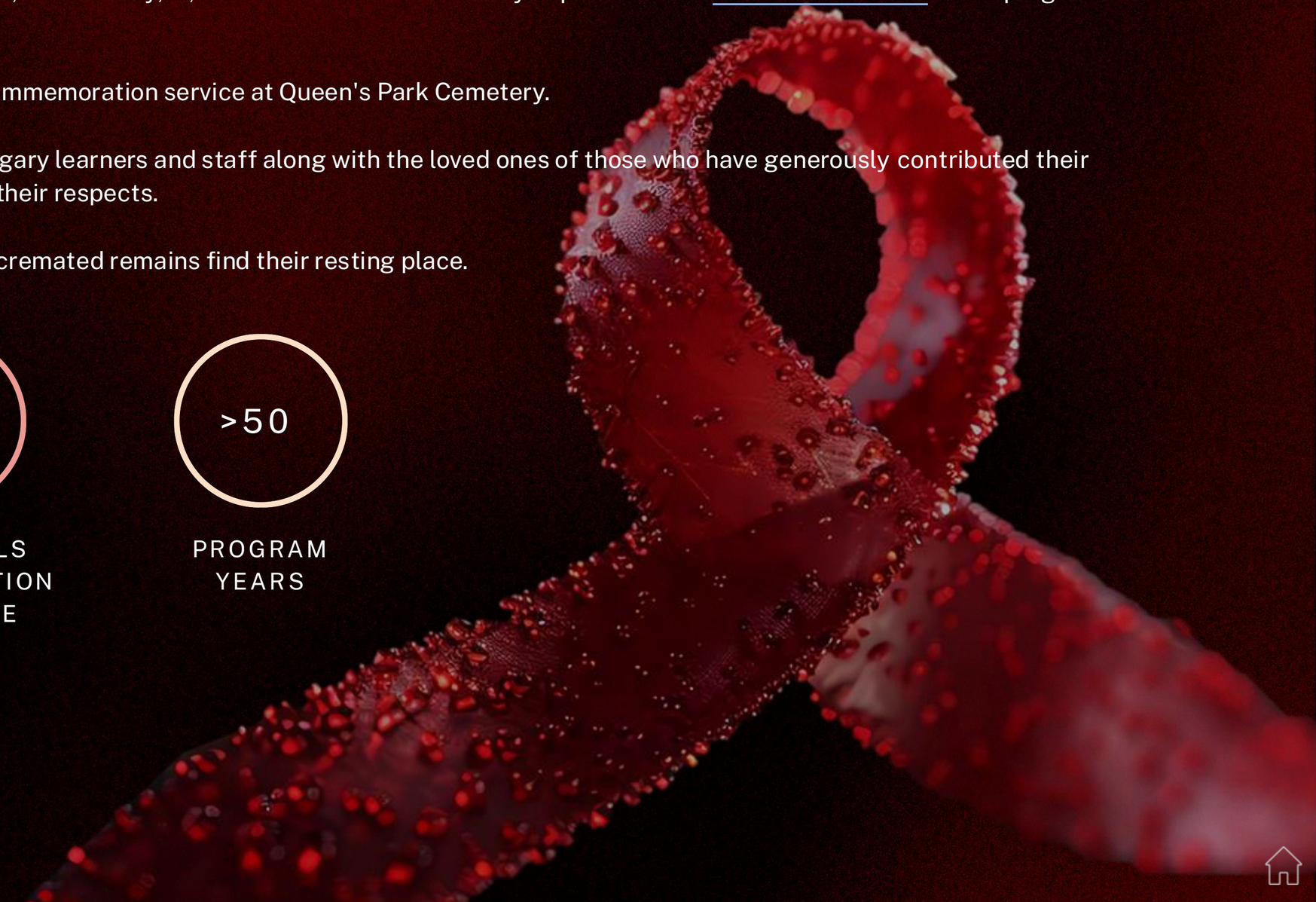
DONORS

11,000

INDIVIDUALS WITH INTENTION TO DONATE

>50

PROGRAM YEARS



2018-2024 PRESERVATION ACTIVITY, BY CATEGORY

Trends

- **68 Total Preservations** in 2023-2024.
- There is a **46% increase** of activity from 2018-2019 to 2023-2024.
  - 57% decrease in Hard-Embalmed specimens.
  - 50% decrease in Light-Embalmed specimens.
  - 85% increase in Non-Embalmed specimens
- The increased demand for surgical skills training requires the utilization of a greater number of **Non-Embalmed** cadavers.

Highlights

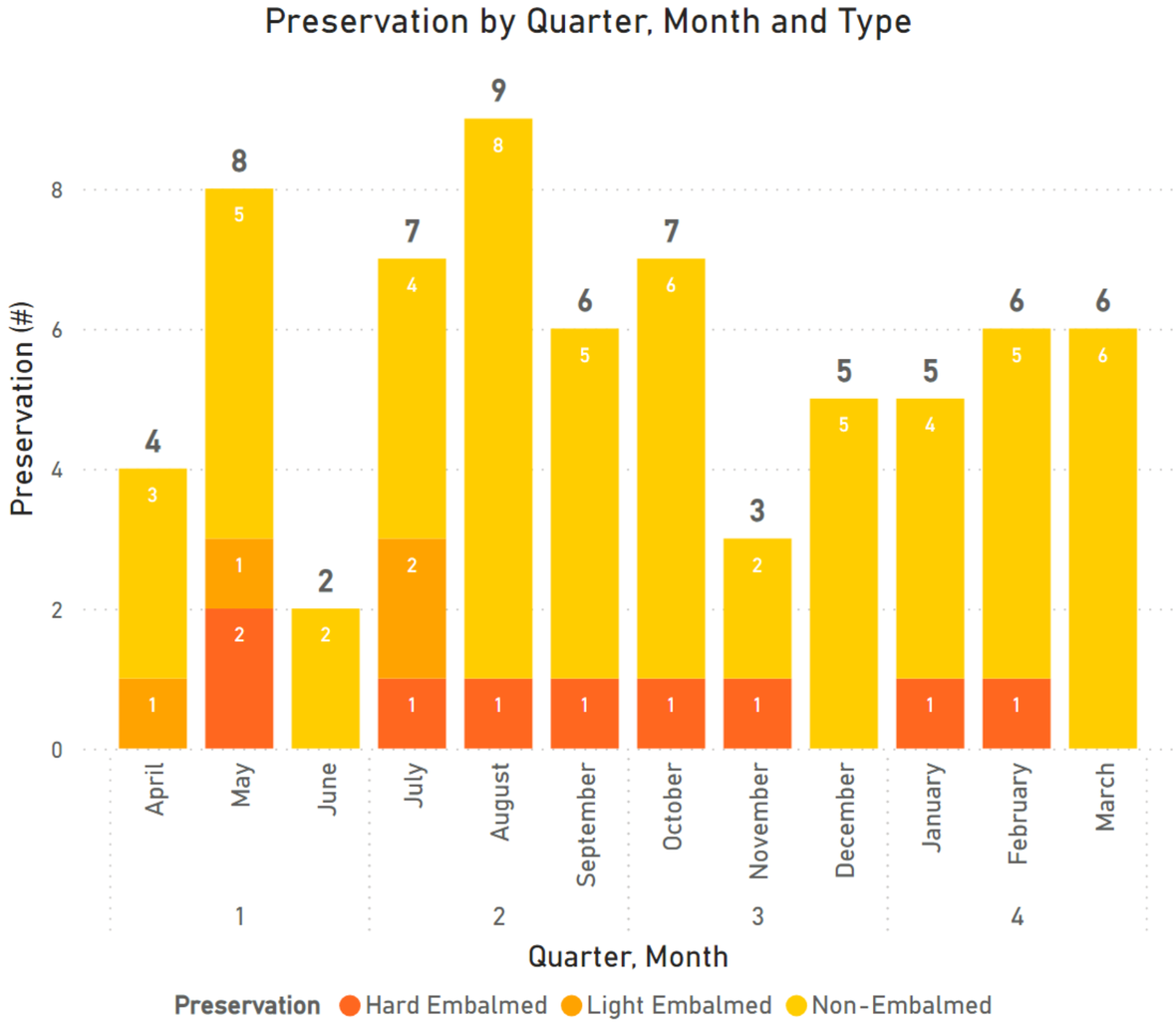
412 Total Specimens
(updated as of 2023-24)

→

167 Hard-Embalmed Specimens (41%)

161 Non-Embalmed Specimens (39%)

78 Light-Embalmed Specimens (19%)



EQUIPMENT HIGHLIGHT

FACILITY

- The ATSSL offers a wide range of equipment that supports comprehensive hands-on training for healthcare professionals.

C-ARM IMAGING SYSTEM

- Our high-quality GE Healthcare OEC Elite CFD 31cm Digital Mobile Super C-Arm enables real-time, high-resolution imaging, critical for procedures requiring precision. It’s an essential tool for fluoroscopy-guided surgeries and radiological interventions.
- The use of GE HealthCare OEC C-arms has been crucial in our simulation-based medical education programs.
- Recently, we acquired another C-arm, further enhancing our capabilities.
- As we continue to leverage the advanced technology of OEC C-arms, we remain committed to providing superior care, achieving excellence in medical imaging, and fostering cutting-edge medical education.

BENEFITS

- These devices have proven invaluable across clinical applications, from spine and orthopedics to cardiac and vascular procedures in the ATSSL.
- Their superior imaging capabilities create realistic, high-fidelity training environments, allowing practitioners to hone their skills and perfect techniques in a controlled, risk-free setting.
- This hands-on experience is essential in preparing the next generation of healthcare providers, ensuring they are well-equipped to deliver exceptional care in real-world scenarios.

RESEARCH

FACILITY

- ATSSL strives to uphold optimal approaches by actively engaging in research and development within the SBME domain.
- This goal is achieved by initiating research endeavors and offering support and valuable insights to external researchers' initiatives.
- A directive from the Royal College mandates that the program engages in both participation and substantial contributions to the wider research community in health professions education, consequently driving the field's advancement.

RESEARCH

- In vivo cadaveric analysis of volar tilt correction using a kickstand screw technique in volar plate fixation for distal radius fractures - **Dr. Peter Longino**
- Dual fluoroscopy for in-vivo analysis of the 3D kinematics of cervical and lumbar degeneration - **Dr. Ganesh Swamy**
- Simulator-Based Training of Orthopedic Residents in Pedicle Screw Fixation via a Minimally-Invasive Surgery - **Dr. Peter Lewkonia**
- Optimal Construct for Fixation of Femoral Neck Fractures: A Biomechanical Analysis - **Dr. Prism Schneider**
- Mechanical Analysis of the epitendinous suture in 4- and 6- strand cadaveric flexor tendon repair - **Dr. Justine Yeung**
- Quantifying In Vivo Cervical Spine Motion and Influence of Cervical Total Disc Arthroplasty - **Dr. Ganesh Swamy**

PUBLICATIONS

- The following publications are the 2023-2024 research studies that ATSSL was involved in:

Ebrahim, A., Reich, C., Wilde, K., Salim, A. M., Hyrcza, M. D., & Willetts, L. (2024). A comprehensive analysis of the tubarial glands. Anatomical record (Hoboken, N.J. : 2007), 10.1002/ar.25561. Advance online publication. https://doi.org/10.1002/ar.25561

Kendal, J. K., Wong, M., Montgomery, S. J., Benavides, B., Monument, M. J., & Puloski, S. K. T. (2022). “In-house” design and use of 3-dimensional printed patient-specific bone tumor resection guides for geometric osteotomies in sarcoma surgery. *Techniques in Orthopaedics, 37*(4), 238–244. https://doi.org/10.1097/BTO.0000000000000581

Ramji, M., Steve, A. K., Premji, Z., & Yeung, J. (2020). Functional outcomes of major upper extremity replantation: A scoping review. *Plastic and Reconstructive Surgery - Global Open, 8*(10), e3071. https://doi.org/10.1097/GOX.0000000000003071

Pichardo, S., Sin, V. W., & Hynynen, K. (2011). Multi-frequency characterization of the speed of sound and attenuation coefficient for longitudinal transmission of freshly excised human skulls. *Physics in Medicine & Biology, 56*(1), 219. https://doi.org/10.1088/0031-9155/56/1/014

Haber, J. (2017). Situational Awareness in Anesthesiology (Master's thesis, University of Calgary, Calgary, Canada). Retrieved from https://prism.ucalgary.ca. doi:10.11575/PRISM/27794 http://hdl.handle.net/11023/3892

CONTACT US

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Special Procedures Lab: specprocedures.atssl@ucalgary.ca

ATSSL Body Donation Program: anatomy@ucalgary.ca

Research Request/ Inquiry: research.atssl@ucalgary.ca

Mailing Address:

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Room BA01
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Calgary, Alberta, Canada
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Phone: 403.220.5271

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Booking Request Overview

JUNE 2024

CUMMING.UCALGARY.CA/ATSSL

UNIVERSITY OF CALGARY

ATSSL
Advanced Technical Skills Simulation Laboratory

THANK YOU.

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